

**GENERAL AVIATION ACCIDENTS: THE UNITED  
STATES AIR FORCE AERO CLUB SOLUTION**

By

KEITH E. BRANDT, B.S., M.S., M.S., M.D.

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# **GENERAL AVIATION ACCIDENTS: THE UNITED STATES AIR FORCE AERO CLUB SOLUTION**

Keith E. Brandt, B.S., M.S., M.S., M.D., M.P.H.  
The University of Texas  
Health Science Center at Houston  
School of Public Health, 1998

Supervising Professor: Jimmy L. Perkins

Aviation is an intrinsically safe mode of travel. In 1994, the United States Air Force system of Aero Clubs put forth substantial effort to put a program in place (*Fly Smart*) to improve flying safety in its aircraft. This study compares the accident rates of Aero Club aircraft with rates seen in general aviation. A comparison is also made of the years prior to implementation of *Fly Smart* to the three years following implementation.

Aero Club records of accidents were available from 1987 through 1997. General aviation mishap statistics are collected by the National Transportation Safety Board and are collated and presented to the public by the Aircraft Owners and Pilots Association in the form of an annual general aviation report. Comparison of these figures show that the Aero Club system had a lower accident rate and fatality rate in all but one study year (1992, Aero Club 10.12 accidents and 2.38 fatal accidents per 100,000 flying hours; general aviation 8.97 accidents and 1.75 fatal accidents per 100,000 flying hours).

The Aero Club accident rate in the period following implementation of *Fly Smart* (1995 – 1997) was lower than before implementation (1987 – 1993, 5.19 versus 1.63,  $p=0.047$ ), while general aviation rates for the same periods were unchanged (8.29 versus 8.00,  $p>0.05$ ). No differences were

seen in rates of larger vs. mid-size or small clubs. There were no differences in the accident rates of closed vs. open clubs.

The Air Force Aero Clubs are certainly more restrictive than general aviation, but the improvement in safety record suggests the tighter regulations are rules you can live with.

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## **INTRODUCTION**

The dawn of powered flight on December 17, 1903, was followed all too shortly by the dawn of aircraft fatalities. Lieutenant Thomas Selfridge of the United States Army died of massive head injuries from a crash sustained during the demonstration of a Wright Flyer piloted by Orville Wright on 17 September, 1908 (DeHart, p. 15).

Unfortunately, this was only the beginning.

## **History and background**

The National Transportation Safety Board (NTSB)<sup>\*</sup> defines an aircraft accident as "an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or the aircraft receives substantial damage". General aviation is defined as the use of aircraft in both personal and business transportation and support of diverse activities, such as recreation, law enforcement, forest fire fighting, freight transportation, air ambulance, and other vital services (AOPA Nall Report, 1996).

If one were to rely solely on reports from the news media, the impression would be that aviation accidents are large-scale disasters involving airlines and hundreds of fatalities. This is because of the media's bias towards sensationalism and the morbid attraction of airline crashes. While these are certainly tragic events, they do not constitute the majority of aviation-related accidents or fatalities. In fact, aviation contributes only a small percentage to the total transportation deaths (Table 1, AOPA Fact Card).

---

<sup>\*</sup> A glossary of military and aviation acronyms appears in Appendix I

| <b>Table 1. Transportation Fatalities 1995</b> |        |        |
|--|--------|--------|
| Total  | 44,347 | 100.0% |
| Highway  | 41,700 | 94.0%  |
| Aviation                                       | 969    | 2.2%   |
| Marine   | 904    | 2.0%   |
| Railroads                                      | 753    | 1.7%   |
| Other  | 21     | 0.0%   |

Of aviation mishaps, general aviation is guilty of contributing the majority of both accidents and fatalities (Table 2, AOPA Fact Card).

| <b>Table 2. U.S. Civil Aviation Accident Data for 1995</b> |  |       |        |
|--|--|-------|--------|
| Total Accidents  |  | 2,174 | 100.0% |
| General Aviation   |  | 2,052 | 94.4%  |
| Air Carrier  |  | 122   | 5.6%   |
| Total Fatal Accidents                                      |  | 440   | 100.0% |
| General Aviation   |  | 411   | 93.6%  |
| Air Carrier  |  | 29    | 6.6%   |
| Total Fatalities   |  | 962   | 100.0% |
| General Aviation   |  | 733   | 76.2%  |
| Air Carrier  |  | 229   | 23.8%  |

General aviation also has a higher accident rate per 100,000 hours flown as compared to air carriers (Table 3, AOPA Fact Card).

| <b>Table 3. Civil Aviation Accident Rate per 100,000 Hours Flown 1995</b> |                 |                 |
|---|-----------------|-----------------|
|   | Total Accidents | Fatal Accidents |
| Total   | 5.24            | 1.06            |
| General Aviation  | 8.72            | 1.75            |
| Air Carrier   | 0.68            | 0.16            |

## Causal factors

Structural failure is rarely a cause of general aviation accidents. Inflight breakup was listed as causative in only 12.8% of accidents occurring in 1970 – 1975 (Kirkham et al. 1978). The problem most often is a human factor,

with some estimates being as high as 90% (Siegel and Mohler, 1969). The National Transportation Safety Board has listed the 10 most common human factors that consistently contribute to crashes (Table 4, Spence, page 237).

**Table 4. Accident Causal Factors**

1. Inadequate preflight preparation and/or planning.
2. Failure to obtain and/or maintain flying speed.
3. Failure to maintain direction control.
4. Improper level off.
5. Failure to see and avoid objects or obstructions.
6. Mismanagement of fuel.
7. Improper inflight decisions or planning.
8. Misjudgment of distance and speed.
9. Selection of unsuitable terrain.
10. Improper operation of flight controls.

### **United States Air Force Aero Club System**

Aero clubs began in 1948 as private organizations. They were first sanctioned at Offutt AFB by General LeMay in 1953. The mission is to enjoy safe, low cost aircraft operations, develop and maintain aeronautical skills, develop awareness and appreciation of aviation, and enjoy a social activity.

Currently, the Aero Club system consists of 34 clubs worldwide: 28 CONUS, 6 OCONUS (Figures 1 and 2). As compared with the rest of the Air Force, the Aero Clubs would fit in as the 4<sup>th</sup> largest Major Command in numbers of aircraft (Table 5), and 6<sup>th</sup> in terms of flying hours (Table 6, Aero Club Headquarters data).

| <b>Table 5. Aircraft by Major Command</b> |                 |
|---|-----------------|
| <b>MAJCOM</b>                             | <b>Aircraft</b> |
| ACC                                       | 1605            |
| AETC                                      | 1473            |
| AMC                                       | 586             |
| <b>AERO CLUBS</b>                         | <b>421</b>      |
| PACAF                                     | 383             |
| AFMC                                      | 299             |
| USAFE                                     | 251             |
| SOC                                       | 124             |
| AFSPC                                     | 45              |
| USAFA                                     | 35              |
| Data as of September 1995                 |                 |

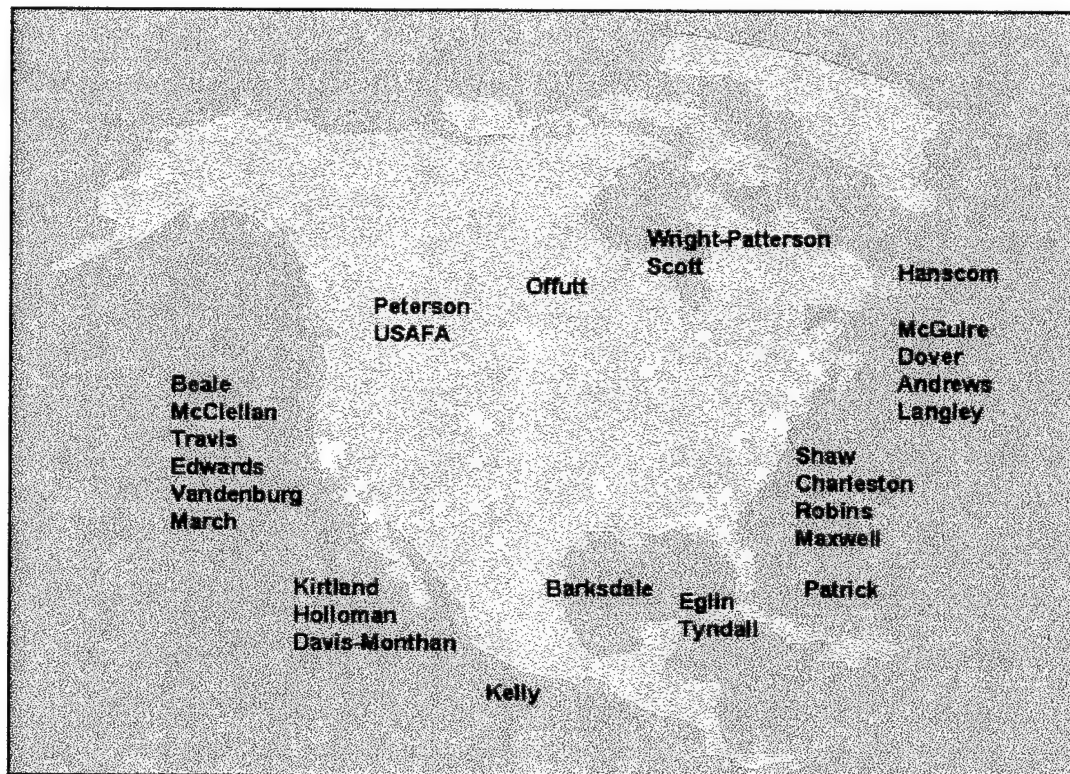


Figure 1. CONUS Aero Clubs

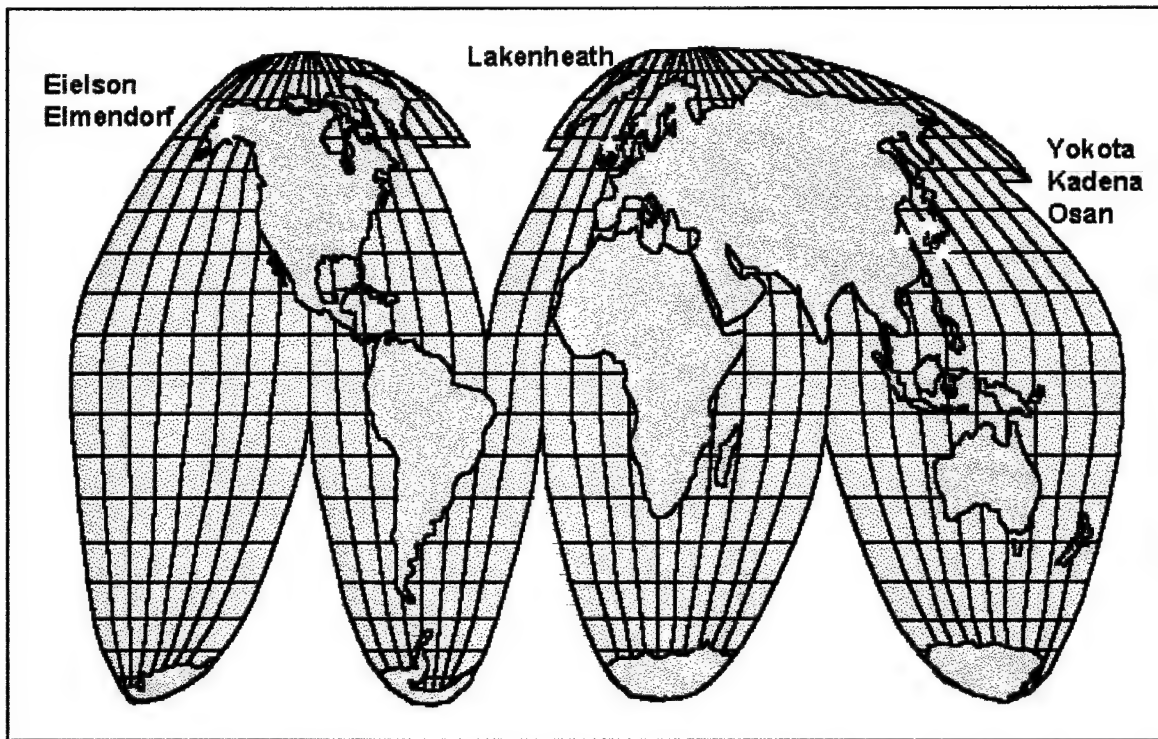


Figure 2. OCONUS Aero Clubs

| <b>Table 6. Annual Flying Hours<br/>by Major Command</b> |                |
|--|----------------|
| <b>MAJCOM</b>  | <b>Hours</b>   |
| ACC  | 542,000        |
| AETC   | 453,000        |
| AMC  | 329,000        |
| PACAF  | 133,000        |
| USAFE  | 112,000        |
| <b>AERO CLUBS</b>  | <b>110,000</b> |
| SOC  | 48,000         |
| AFMC   | 33,000         |
| AFSPC  | 14,000         |
| USAFA  | 14,000         |
| Data as of September 1995                                |                |

## ***Fly Smart***

Aero Club management instituted a program called ***Fly Smart*** in 1994 with a goal of reducing the accident rate. The program consists of five elements (Figure 3, Aero Club Headquarters briefing) which integrate different aspects of general aviation risk management.

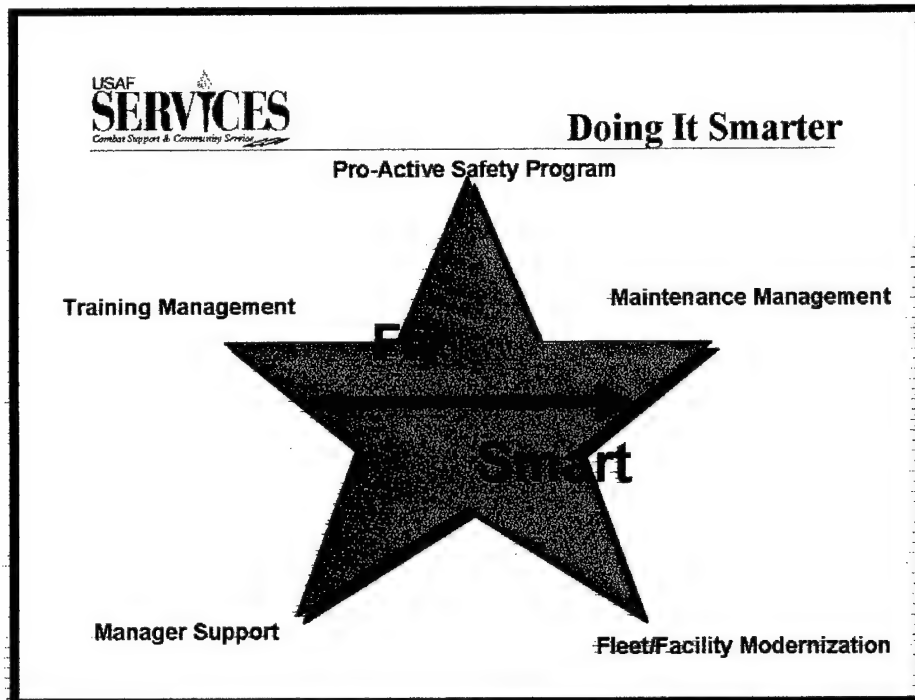


Figure 3. The *Fly Smart* Program

### 1. Pro-Active Safety Program

Involvement was sought from the MAJCOM commander with the MAJCOM providing Safety, Maintenance, & Operations Advisors. At the wing level (typically the same as the base level), the wing (or installation) commander would also appoint Safety, Maintenance, & Operations Advisors. At the Aero Club level, Safety, Maintenance, & Operations Officers are to be appointed. Each member of the club was required to attend monthly safety meetings.

The Aero Club headquarters would provide a Safety Officer training course, Command Safety presentations, annual inspections, mishap

databasing, standardization programs, testing, regulatory requirements, checkout programs, mishap trend analysis, and materiel failure trend analysis.

## 2. Training Programs

Standardized training requirements would increase supervisory involvement with student pilots, member checkouts and required annual checkrides. Aero Club regulations raised standards from the FAR minimums. Aero Clubs were required to operate under FAR Part 141 which mandated closer FAA oversight. Training courses were developed for Aero Club Managers, Chief Flight Instructors, and Chiefs of Maintenance.

## 3. Maintenance Management

Maintenance requirements were made stricter than in general aviation. Aircraft and engines are inspected annually and every 100 hours. Mandatory overhaul was to be performed at TBO with no waiver for extension. Since the FAA is relatively slow to respond to known mechanical deficiencies, the Aero Club provided service bulletins, safety alerts, and airworthiness directives in a timely manner, and would mandate compliance. Aero Club Headquarters developed the Maintenance Officer training program, trend analysis and pro-active maintenance intervention programs. The Aero Club regulations raised the standards beyond the FARs.

## 4. Manager Support

Club managers were given operational guidance through AFI 34-117 and AFMAN 34-132. Procedures were developed to establish responsibility and accountability. Managers also were provided access to software support, quality control for dispatching aircraft, financial accounting, and a Smart Buy program which was expanded to meet manager's requirements allowing clubs to buy quality products at wholesale prices.

## 5. Fleet Modernization

The average age of the Aero Club fleet was over 21 years.

Purchasing new aircraft would decrease maintenance costs by 25%. Also, new aircraft tend to increase member satisfaction. This investment was considered low-risk due to the high resale value of new aircraft.

## USAF Regulations

The regulations in place at the start of the study were known as Air Force Regulations (AFR). The regulation system gradually began switching over to a hierarchical structure with broad policy documents separated from more detailed instructions. The main publications in the new system are as follows (exerted from AFI 37-160, section 2.10):

**Air Force Instructions (AFI).** AFIs are orders of the Secretary of the Air Force and are approved in the Secretariat or the Air Staff ... and will be issued as departmental publications. They are usually drafted at the MAJCOM and FOA level and provide essential procedural guidance necessary to implement Air Force Policy in the field. All AFIs must have an antecedent AFPD (Air Force Policy Directive). AFIs may be supplemented at any level. Subordinate activities may also issue instructions, which will be designated with the acronym of the command; e.g., ACCI (for Air Combat Command Instruction). These are specific instructions necessary to implement AFPDs at their field units and will be written by the MAJCOM or local headquarters.

**Air Force Manuals (AFMAN).** AFMANs are guidance documents consisting of procedures that usually contain examples for performing standard tasks, supporting education and training programs (AFI 36-2201, Developing, Conducting, and Managing Training (formerly AFR 4-66)), or computer system operating instructions. Manuals may be supplemented at any level. Subordinate activities may also issue manuals, which will be designated with the acronym of the command; e.g., ACCMAN (for Air Combat Command Manual).

## Aero Club Regulations

The Aero Club is governed by the Federal Air Regulations as is general aviation at large. The clubs are additionally controlled by Air Force regulations. At the beginning of the study period, the governing regulation



was AFR 215-12. When the regulations were changed to the present system of Air Force Instructions, the governing documents became AFI 34-117 and AFMAN 34-132, which were superseded by AFI 34-217 and AFMAN 34-232. Table 7 gives the effective dates of the specific publications and their revisions.

| <b>Table 7. Aero Club Regulatory Documents and Effective Dates</b> |                       |
|--|-----------------------|
| <b>Publication</b>   | <b>Effective Date</b> |
| AFR 215-12   | 24 Feb 86             |
| AFR 215-12   | 5 Sep 88              |
| AFI 34-117   | 21 Jul 94             |
| AFM 34-132   | 4 Nov 94              |
| AFI 34-117   | 17 Feb 95             |
| AFI 34-217   | 1 Feb 97              |
| AFM 34-232   | 1 Feb 97              |
| AFM 34-232   | 1 Aug 97              |

In November 1996, the Instructor Standardization Guide was published. It is not designated by an Air Force publication number, but all Aero Club flight instructors are required to test by its standards. The Guide was updated in February and August 1997.

## **Study Purpose**

The purpose of this study was to analyze the past 10 years of Aero Club and general aviation accidents, comparing the rates in the two groups. The Aero Club accident rates were compared pre- and post-1994 (implementation of *Fly Smart* program). The goal is to identify program factors that lead to increased flying safety.

## **MATERIALS AND METHODS**

### **Data Collection**

Aero Club Headquarters maintains routine records of the number of flying hours conducted by each club. This data has been collected on a quarterly basis since 1988. Data are missing for the second and third quarters of 1988, and the third quarter of 1989.

Headquarters also is the repository for information on accidents involving Aero Club operated aircraft. Unlike the data collected by the NTSB, the Aero Club records include *any* aircraft damage or incidents. For the purpose of this study, an incident recorded by the Aero Club was not included unless it met the NTSB definition of an accident. NTSB and FAA accident data was taken from published sources.

### **Data Analysis**

Data were analyzed utilizing NCSS-97, 12 March 1998 release (Hintze, 1998).

The Aero Club accident rates for each year in the study were compared to the average General Aviation rate for the study period (8.272 accidents per 100,000 flying hours) using Poisson analysis. Fatal accidents were also compared utilizing a Poisson distribution.

Accident rates before and after 1994 were compared using a one-tailed two-sample t-test assuming equal variances. Accidents by club size were analyzed using the Kruskal-Wallis One-Way ANOVA on Ranks.

### **Imputation of Data**

The Aero Club operating data from the second and third quarters of 1988 and third quarter of 1989 were not recorded and the values used in this study were estimated. To obtain the estimate, each year that a club had complete data from all four quarters of the calendar year was included. The percentage of flying hours each quarter represented for that club within the

year was calculated. The average of each quarter across all clubs and years was taken, rounded to the nearest whole percentage (to make the total equal 100%). This average percentage per quarter was used in conjunction with the hours flown in the quarters with data present to calculate an estimate for the missing data.

## RESULTS

### Rates Before and After *"Fly Smart"* Implementation

As a test of effectiveness of the *Fly Smart* program, the accident rates from 1988 to 1993 were compared to the rates in 1995 to 1997 to give a before/after comparison. 1994 was excluded from analysis as it was the transitional year. Rates by year were compared using a one-tailed two-sample t-test assuming equal variances (Table 8).

| <b>Table 8. Aero Club<br/>Accident Rate Before<br/>and After 1994</b> |                  |
|---|------------------|
| <b>Period</b>   | <b>Mean Rate</b> |
| 1988 - 1993   | 5.19             |
| 1995 - 1997   | 1.63             |
| 1988-1994 is significantly<br>higher (one-sided $p=0.047$ )           |                  |

The General Aviation rates for the pre- and post-1994 periods were compared in the same manner as the Aero Clubs (Table 9).

| <b>Table 9. General Aviation<br/>Accident Rate Before and<br/>After 1994</b> |                  |
|--|------------------|
| <b>Period</b>  | <b>Mean Rate</b> |
| 1988 -1994   | 8.29             |
| 1995 -1997   | 8.00             |
| One-sided $p=0.211$  |                  |

The accident rate in the 3 years following implementation of *Fly Smart* is statistically significantly lower than in the 6 years prior to 1994. There was no difference in the rate of accidents in the General Aviation population comparing the same time frame.

Fatality rates were similar for Aero Clubs and General Aviation during 1988 - 1994 and the rate was lower for the Aero Clubs during the period

1995 – 1997,  $p = 0.02$  (Table 10).

| <b>Table 10. Fatality Rates Before and After 1994</b> |                            |                                   |           |
|---|----------------------------|-----------------------------------|-----------|
| <b>Period</b>   | <b>Aero Club Mean Rate</b> | <b>General Aviation Mean Rate</b> |           |
| 1988 -1993  | 1.02                       | 1.65                              | $p= 0.15$ |
| 1995 -1997  | 0.31                       | 1.54                              | $p= 0.02$ |
|   | $p= 0.27$                  | $p= 0.26$                         |           |

### **Differences in FAA and Aero Club Regulations**

The Aero Club regulations typically are more conservative than the FAA regulations. Appendix II contains Air Force Regulation AFMAN 34-232, the operating regulations for the Aero Clubs. This document gives operating procedures for pilots and aircraft operating within the Aero Club system. The operating instructions in AFMAN 34-232 are the differences from the FAA Federal Air Regulations. Aero Club members are expected to follow the FAR unless superceded by AFMAN 34-232.

### **Accident Rates in the Aero Club and General Aviation**

Tables 11 and 12 show the overall accidents, fatalities, flying hours, and accident rates for the Aero Club system and general aviation.

| <b>Table 11. USAF Aero Club Mishaps</b>                                      |                  |              |                         |              |                         |
|--|------------------|--------------|-------------------------|--------------|-------------------------|
| <b>Year</b>  | <b>Accidents</b> | <b>Hours</b> | <b>Rate<sup>1</sup></b> | <b>Fatal</b> | <b>Rate<sup>1</sup></b> |
| 1988   | 11               | 170,689      | 6.44                    | 2            | 1.17                    |
| 1989   | 5                | 176,568      | 2.83                    | 0            | 0.00                    |
| 1990   | 11               | 188,064      | 5.85                    | 2            | 1.06                    |
| 1991   | 4                | 180,155      | 2.22                    | 0            | 0.00                    |
| 1992   | 17               | 167,928      | 10.12                   | 4            | 2.38                    |
| 1993   | 5                | 135,137      | 3.70                    | 2            | 1.48                    |
| 1994   | 1                | 124,328      | 0.80                    | 1            | 0.80                    |
| 1995   | 2                | 107,793      | 1.86                    | 1            | 0.93                    |
| 1996   | 3                | 98,737       | 3.04                    | 0            | 0.00                    |
| 1997   | 0                | 96,943       | 0.00                    | 0            | 0.00                    |
| <sup>1</sup> Rate is per 100,000 flying hours<br>Data from Aero Club records |                  |              |                         |              |                         |

| <b>Table 12. General Aviation Mishaps</b>        |           |            |      |       |      |
|--|-----------|------------|------|-------|------|
| Year   | Accidents | Hours      | Rate | Fatal | Rate |
| 1988   | 2,387     | 27,446,000 | 8.70 | 460   | 1.68 |
| 1989   | 2,232     | 27,920,000 | 7.99 | 431   | 1.54 |
| 1990   | 2,215     | 28,510,000 | 7.77 | 443   | 1.55 |
| 1991   | 2,176     | 27,226,000 | 7.99 | 434   | 1.59 |
| 1992   | 2,073     | 24,800,000 | 8.36 | 446   | 1.80 |
| 1993   | 2,038     | 22,800,000 | 8.94 | 398   | 1.75 |
| 1994   | 1,995     | 22,240,000 | 8.97 | 404   | 1.82 |
| 1995   | 2,055     | 23,930,000 | 8.59 | 412   | 1.72 |
| 1996   | 1,905     | 24,100,000 | 7.90 | 359   | 1.49 |
| 1997   | 1,854     | 24,700,000 | 7.51 | 350   | 1.42 |
| Average <sup>2</sup> =                           |           |            | 8.27 |       | 1.64 |
| <sup>1</sup> Rate is per 100,000 flying hours    |           |            |      |       |      |
| <sup>2</sup> Average used in Poisson comparisons |           |            |      |       |      |
| Data from NTSB Aviation Accident Statistics      |           |            |      |       |      |

Figures 4 and 5 present this data graphically.

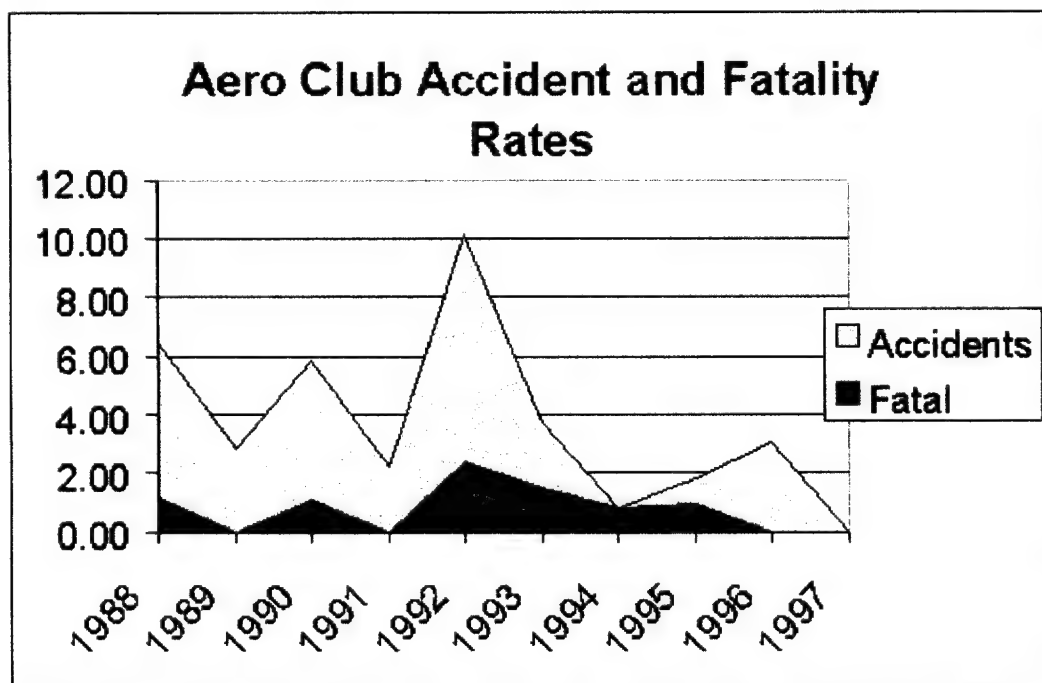


Figure 4. Aero Club Accident and Fatality Rates

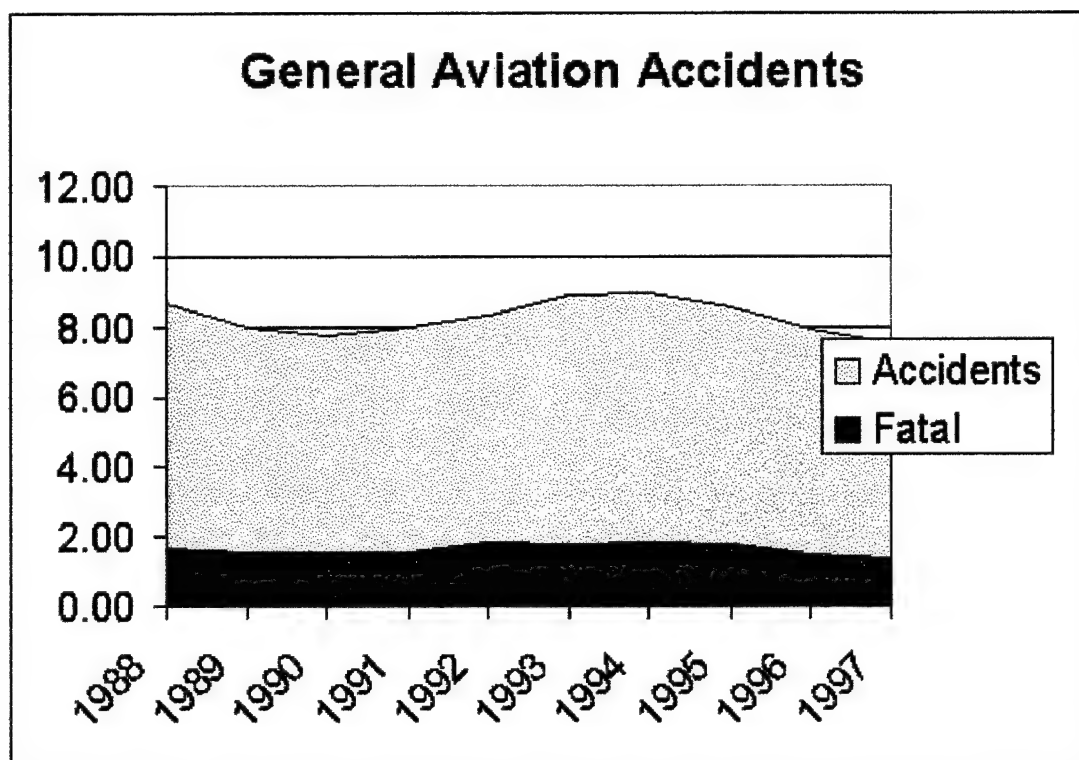


Figure 5. General Aviation Accident and Fatality Rates

### Comparison of Accident Rates

The Aero Club accident rates for each year in the study were compared to the average General Aviation rate for the study period (8.272 accidents per 100,000 flying hours). Fatal accidents were likewise compared (General Aviation rate 1.636 fatalities per 100,000 flying hours). Table 13 and 14 present this analysis with a graphical representation in Figures 6 and 7.

The Aero Clubs, with the exception of 1992, showed a lower accident rate than general aviation ( $p < .05$  except for 1988, 1990, and 1992). Fatality rates, however, were similar for Aero Clubs and general aviation during the 10 years of this study when compared on a year-to-year basis.

**Table 13. Aero Club Accident Rates Compared to General Aviation Average Rate of 8.27 per 100,000 Flying Hours**

| Year | Rate  | <i>p</i> value |
|------|-------|----------------|
| 1988 | 6.44  | 0.28           |
| 1989 | 2.83  | 0.01           |
| 1990 | 5.85  | 0.17           |
| 1991 | 2.22  | 0.01           |
| 1992 | 10.12 | 0.79           |
| 1993 | 3.70  | 0.04           |
| 1994 | 0.80  | 0.0003         |
| 1995 | 1.86  | 0.002          |
| 1996 | 3.04  | 0.04           |
| 1997 | 0.00  | 0.0003         |

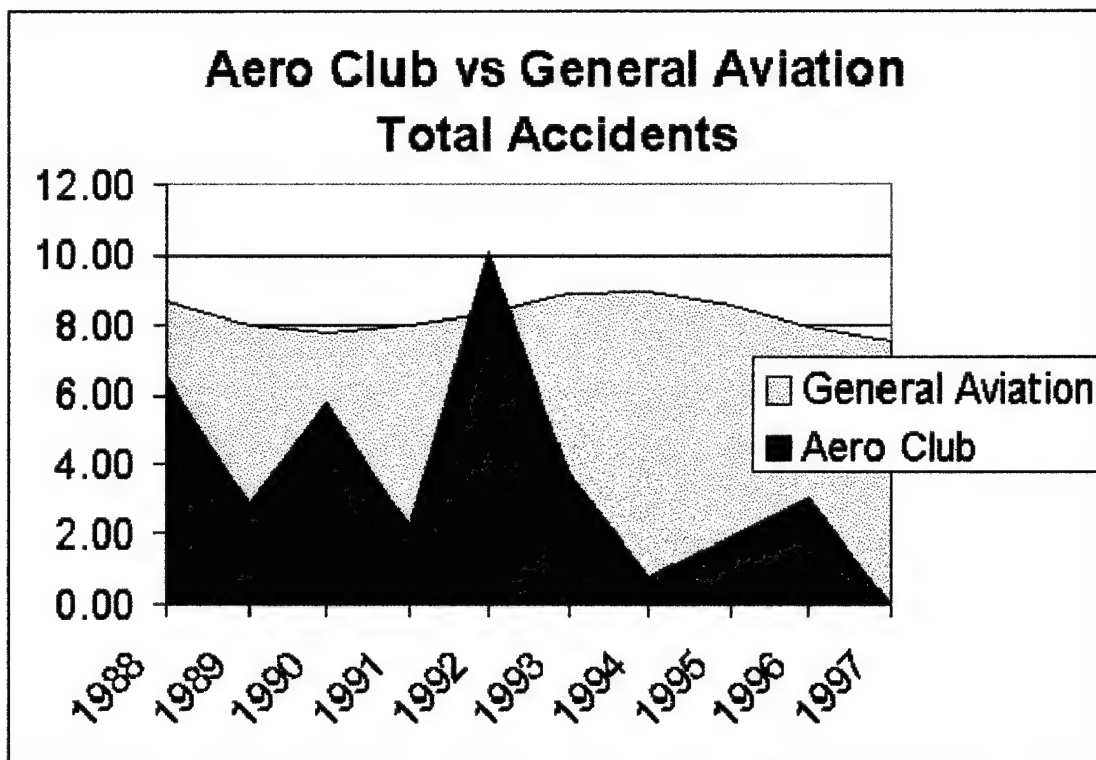


Figure 6. Aero Club vs. General Aviation – Total Accidents



**Table 14. Aero Club Fatality Rates  
Compared to General Aviation  
Average Rate of 1.64 per 100,000  
Flying Hours**

| Year | Rate | <i>p</i> value |
|------|------|----------------|
| 1988 | 1.17 | 0.51           |
| 1989 | 0.00 | 0.19           |
| 1990 | 1.06 | 0.51           |
| 1991 | 0.00 | 0.19           |
| 1992 | 2.38 | 0.77           |
| 1993 | 1.48 | 0.51           |
| 1994 | 0.80 | 0.19           |
| 1995 | 0.93 | 0.19           |
| 1996 | 0.00 | 0.19           |
| 1997 | 0.00 | 0.19           |

No values statistically significant at the 0.05 level

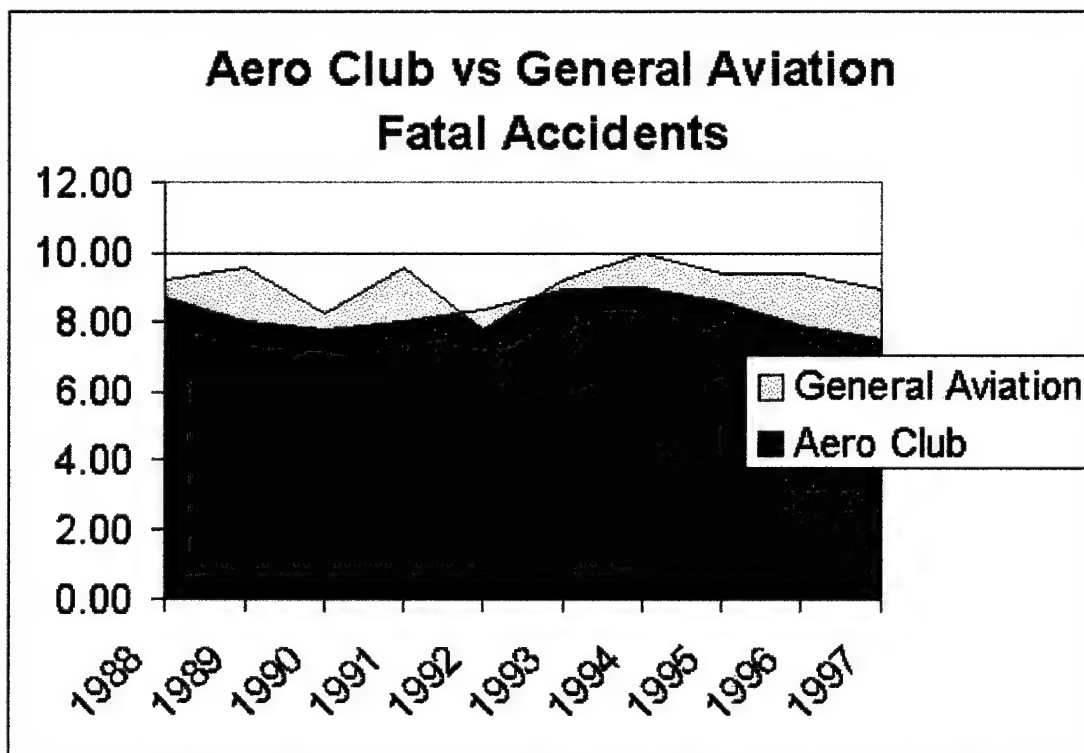


Figure 7. Aero Club vs. General Aviation – Fatal Accident

The Aero Club accident rate was significantly lower than general aviation in 7 of the 10 years studied. All years from 1993 to 1997 had significantly lower accident rates than general aviation. Fatality rates in the Aero Club were similar to general aviation in all years studied.

### **Accidents by Club Size**

Clubs were divided into 'Small', 'Medium', or 'Large' based on average annual flying hours. Clubs with 3000 or less were classified as 'Small', 3001 to 6000 as 'Medium', and greater than 6000 as 'Large.' These breaks are roughly based on natural breaks in the distribution. A Kruskal-Wallis One-Way ANOVA on Ranks was utilized to analyze differences in accident rates among group sizes (Table 15).

| <b>Table 15. Aero Club Accident Rate by Club Size</b> |              |                    |                       |
|---|--------------|--------------------|-----------------------|
| <b>Club Size</b>                                      | <b>Count</b> | <b>Median Rate</b> | <b>Range of Rates</b> |
| Large   | 5            | 3.74               | 0 to 4.37             |
| Medium  | 20           | 3.06               | 0 to 15.99            |
| Small   | 23           | 2.26               | 0 to 38.14            |
| No values statistically significant at the 0.05 level |              |                    |                       |

This analysis suggests that there is no detectable difference in the accident rates of large, medium, or small clubs.

### **Club Attrition vs. Accident Rates**

Clubs were defined as 'Active' or 'Closed' based on their status as of 31 Dec 1997. The accident rate of the closed clubs was compared to the rate of the clubs that remained open. The Mann-Whitney U test was used to determine differences in rates (Table 16).

| <b>Table 16. Aero Club Accident Rate by Operating Status as of 31 Dec 1997</b> |              |                    |                       |
|--|--------------|--------------------|-----------------------|
| <b>Club Status</b>   | <b>Count</b> | <b>Median Rate</b> | <b>Range of Rates</b> |
| Open   | 35           | 3.06               | 0 to 16.59            |
| Closed   | 13           | 0.91               | 0 to 38.14            |
| No values statistically significant at the 0.05 level                          |              |                    |                       |

There is no statistically significant difference in the accident rates of clubs that were active at the conclusion of the study period and those that had closed in the previous 10 years.

## DISCUSSION

The military has a reputation for being conservative, and the Aero Club system is no exception. The rules and regulations governing Aero Club flying as contained in AFMAN 34-232 are much more restrictive than what is mandated by the FAA. These differences are typically a broadening of the safety margins, such as increased fuel reserves than required by the FAA and no VFR night cross-country flights. Recurrent training is also mandatory in the Aero Clubs as are more frequent flight checks. These increased restrictions may be seen by some as an infringement on personal freedoms, but if the tradeoff is a safer flying record, then it is probably worth living with the restrictions.

Reporting of aircraft accidents is governed by NTSB regulation 830. However, just as with automobiles, there is reluctance to report an incident if at all possible. Economic concerns such as insurance rates and fear of legal or administrative action such as loss of license are major factors in under-reporting. An apocryphal story is a pilot losing control of a plane while taxiing to the runway and then reporting that he was simply performing a taxi test and had 'no intent for flight' and therefore the incident was not reportable. The damage was fixed privately, therefore the NTSB and insurance company were not notified. This scenario would not occur in the Aero Club system. The same agency that pays for repair collects the accident reports. Part of the difference could be the method by which accidents are reported. While individual pilots may still have something to gain by suppressing knowledge of an incident, the multiple pilots checking each plane make it less likely that damage could be hidden. The extensive flying records make it fairly easy to track down when damage occurred, and who was responsible for an aircraft at that time. This difference in reporting would tend to positively bias the Aero Club mishaps and negatively bias the general aviation mishaps. This would therefore suggest that the true difference is actually greater than presented here.

Club size was evaluated as a possible factor in accident rates. An accident might be more likely in a larger club simply due to greater exposure (flying hours), or a smaller club could be at risk due to less experience. The median rates were found to be similar among the three club-size groups, suggesting that accident rates are not dependent on the size of the Aero Club.

The number of clubs decreased from 48 at the beginning of 1988 to 35 at the end of 1997. One possible reason for clubs to close is because of a high accident rate. The median accident rate for closed clubs was actually lower than the rate for clubs that remained open, though the difference was not statistically significant. It has been suggested that closing a club was punishment for having an accident, however the majority of clubs were closed due to the supporting base closing.

An important question is why the Aero Clubs have a lower accident rate. Following the peak in accidents in 1992, the Aero Club developed the "*Fly Smart*" program as a comprehensive effort to decrease accident rates. The program appears to be successful as the rate from 1988 through 1993 was significantly lower than 1995 through 1997 (Table 14). In comparison, the general aviation rates were similar for both pre- and post-1994 (Table 15). This would suggest that the *Fly Smart* program has been successful at decreasing accident rates within the Aero Club system.

## **Power**

A major difficulty in evaluating rare events is having adequate power to detect differences. This is true in evaluating general aviation accidents as they are, thankfully, rare events. In each of the analyses used, the ability to detect differences was low due to the small numbers. However, despite a power of only 54% for the accident rates of 1988 – 1993 compared to 1994 – 1997, a significant difference was detected.

## **Conclusion**

Travel by air is one of the safest modes of travel available, as well as a source of recreation for thousands of private pilots. Members of the United States Air Force Aero Clubs are part of a system of aviation that has proven it's ability to improve the safety flying, despite some personal restrictions. If these restrictions help a pilot to arrive safely at his destination, then they are well worth the minor inconvenience.

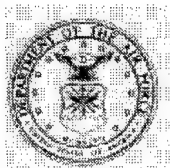
## **Appendix I. Acronym Glossary**

|        |   |
|--------|---|
| ACC    | Air Combat Command  |
| AETC   | Air Education and Training Command  |
| AFB    | Air Force Base  |
| AFI    | Air Force Instruction (AFIs have replaced the older AFRs)   |
| AFM    | Air Force Manual  |
| AFMAN  | Air Force Manual  |
| AFMC   | Air Force Materiel Command  |
| AFPD   | Air Force Policy Directive  |
| AFR    | Air Force Regulation  |
| AFSPC  | Air Force Space Command   |
| AIM    | Aeronautical Information Manual   |
| AMC    | Air Mobility Command  |
| AOPA   | Aircraft Owners and Pilots Association  |
| CC     | Commander   |
| CONUS  | Continental United States   |
| CY     | Calendar Year   |
| FAA    | Federal Aviation Administration   |
| FAR    | Federal Air Regulations   |
| FY     | Fiscal Year (1 October to 30 September)   |
| IFR    | Instrument Flight Rules   |
| MAJCOM | Major Command (e.g., ACC, AMC, AETC)  |
| NTSB   | National Transportation Safety Board  |
| OCNUS  | Outside of the Continental United States  |
| PACAF  | Pacific Air Forces  |
| SOC    | Special Operations Command  |
| TBO    | Time Between Overhauls. Manufacturer recommendation for number of operating hours on an aircraft engine before needing an overhaul. |
| USAF   | United States Air Force   |
| USAFA  | United States Air Force Academy   |
| USAFE  | United States Air Forces - Europe   |
| VFR    | Visual Flight Rules   |

## Appendix II. Aero Club Regulation AFMAN 34-232

BY ORDER OF THE  
SECRETARY OF THE AIR FORCE

AIR FORCE MANUAL 34-232  
1 NOVEMBER 1997



Services

AERO CLUB OPERATIONS

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OPR: HQ AFSVA/SVPAR (Lt Col Roger Sharp) Certified by: HQ USAF/ILV (Mr. Arthur J. Myers)  
Supersedes AFMAN 34-132, 1 Feb 97

Pages: 39  
Distribution: F

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This manual implements AFI 34-217, *Air Force Aero Club Program*, by providing detailed operational requirements, restrictions, and operating procedures for Air Force Aero Clubs. A (f) indicates revisions from the previous edition.

### SUMMARY OF REVISIONS

This manual clarifies aircraft registration procedures, PIF documentation, pilot currencies, training under FAR part 141, pilot checkout requirements, instructor requirements, and maintenance status documentation. Additionally, it clarifies requirements for 100 hour aircraft inspections. (Note: A number of administrative changes were made to comply with AF formatting policy)



## Chapter 1

### GENERAL PROGRAM GUIDANCE

**1.1. Specific Application.** Commanders at each echelon, aero club personnel, members, and others responsible for implementing the Air Force Aero Club Program will comply with applicable Air Force Policy Directives and Instructions, Federal Aviation Regulations (FAR), National Transportation Safety Board (NTSB) statutes, and this manual. Compliance with this publication is mandatory.

1.1.1. MAJCOMs may supplement this manual as needed with approval from HQ AFSVA, Directorate of Programs, Recreation and Business Branch (HQ AFSVA/SVPAR), 10100 Reunion Place, Suite 402, San Antonio TX 78216-4138.

1.1.2. Waiver authority for requirements and restrictions detailed in this manual is HQ AFSVA/SVPAR. Waiver requests must be signed by the Services commander or division chief and a copy forwarded to the MAJCOM.

1.1.3. Pilots may deviate from requirements and restrictions in this manual to the extent required to meet an emergency situation. Pilots shall report any deviation from this manual to the Aero Club Manager as soon as practicable.

**1.2. Establishing an Aero Club.** Persons who wish to establish a club will inform the local Services commander or division chief who will conduct a base-wide survey to determine the potential size of the initial organization, club growth potential, and type of flying desired. The services commander or division chief will coordinate with the base safety office, civil engineering, and base operations to ensure feasibility. He/she will call a meeting of interested people to study the survey results. If results are favorable, the Services commander or division chief appoints interested individuals eligible for membership to temporarily direct the club until aero club staff assume duties.

1.2.1. The Services commander or division chief will assist appointed individuals to obtain applicable Air Force publications, write the club Standard Operating Procedures (SOP), develop the financial plan, and obtain installation commander approval.

1.2.2. The Services commander or division chief ensures the club does not begin operation or obligate funds until each of the following is accomplished:

- A manager is appointed.
- Administrative files are established according to AFI 37-138, *Records Disposition--Procedures and Responsibilities*.
- A pre-operational activity inspection is conducted by the base safety office, MAJCOM, and HQ AFSVA/SVPAR
- HQ AFSVA/SVPAR is advised, in writing, the club is established.

1.2.3. When the pre-operational activity inspection is completed, the inspection team briefs the club manager who ensures any discrepancies are corrected. The corrective action report is forwarded to the installation commander who authorizes flight operations.

**1.3. Dissolving an Aero Club .** The installation Services commander or division chief will notify the MAJCOM/SV and HQ AFSVA/SVPAR 60 days prior to dissolving an aero club.

1.3.1. Disposition of government owned/loaned aircraft will be determined by HQ AFSVA/SVPAR.

**1.4. Insurance Programs.** Managers must get written permission from HQ AFSVA/SVPAR before a newly acquired aircraft may be operated. Managers shall send a written request to HQ AFSVA/SVPAR, identifying the following for each aircraft requiring insurance:

- Aircraft make, model, and year.
- Airframe, engine(s), propeller(s) serial numbers.
- Federal Aviation Administration (FAA) registration number.
- Total number of seats.
- Declared value.
- Date obtained.
- Total time; airframe, engine(s) and propeller(s).
- Total time since major overhaul; engine(s) and propeller(s).
- Detailed avionics listing.

**1.5. Initiation Fees.** Clubs may charge members an initiation fee to cover administrative costs of establishing membership. When a member transfers to another aero club, an initiation fee should not be charged if the member presents a letter of good standing from the previous club. Managers will accept a letter of good standing from any other military aero club.

**1.6. Member Records.** Managers shall maintain a membership/training folder for each member, according to Attachment 7.

1.6.1. Members are given a copy of their membership and training records (excluding FAA and Veterans Administration records) and a letter of good standing upon terminating or transferring membership, provided the member has cleared his/her account and is not under investigation.

1.6.2. Managers shall issue membership cards to identify members.

## Chapter 2

### AIRCRAFT, EQUIPMENT, AND SUPPLIES

**2.1. Purchasing and Leasing Aircraft .** Clubs are authorized to acquire aircraft according to AFI 34-217. Aircraft with more than six seats require HQ AFSVA/SVPAR approval. As a minimum, managers must consider membership needs, flying hour expenses, and financial obligations before purchasing or leasing an aircraft.

2.1.1. Make any purchases or lease purchases of aircraft through HQ AFSVA/SVC. The Nonappropriated Funds (NAF) Council and the installation commander must approve any purchase; once approved, managers shall send an AF Form 9, **Request for Purchase**, including make, model, year, and exact equipment desired, to the MAJCOM/SV for review and action. For used aircraft, managers will include a signed sole-source statement listing each of the following:

- Overall condition.
- Airframe and engine damage history.
- Total time; engine(s), airframe, propeller(s.)
- Time since major overhaul.
- Avionics list.

2.1.2. MAJCOM/SVs will send the approved request to HQ AFSVA, Director of NAF Purchasing (SVC) for purchase action. HQ AFSVA/SVC contacts the seller, obtains the exact cost for the aircraft, and writes the contract.

2.1.3. Managers may also purchase other supplies and equipment, such as replacement engines, spare parts, training programs, and avionics through HQ AFSVA/SVC.

**2.2. Government-Loaned Aircraft.** Clubs are authorized excess Department of Defense aircraft according to AFI 34-217. Gaining clubs are responsible for any repairs necessary to ensure airworthiness. Clubs that acquire government loaned aircraft shall:

- Maintain aircraft and engines intact. (NOTE: Salvaging government-loaned aircraft and engines, including spare engines, is permitted only with HQ USAF, Directorate of Programs (XPPL) approval. Make applications through HQ AFSVA/SVPAR.)
- Register and maintain aircraft in an airworthy condition according to FAA regulations.
- Remove all Army, Navy, or Marine markings.
- Create and maintain aircraft and engine logbooks according to FAA directives.
- File and retain Air Force Technical Order 781 series forms, or aircraft maintenance history documents received with the aircraft at the time of transfer to the club.
- Notify HQ AFSVA/SVPAR when a loaned aircraft is no longer needed.

2.2.1. HQ AFSVA/SVPAR reassigns aircraft to optimize usage. (NOTE: If HQ AFSVA/SVPAR determines an aircraft should be turned in for salvage or disposal, the club manager shall ensure an AFTO Form 92, **Aerospace Vehicle Condition Inspection Report**, is completed, signed by the installation commander, and forwarded to HQ AFSVA/SVPAR for disposition.)

2.2.2. Clubs will dispose of non-serviceable aircraft according to AFMAN 23-110, *USAF Supply Manual*, and Technical Order 1-1-638, *Repair and Disposal of Aerospace Vehicles*. Aircraft disposal requires HQ AFSVA/SVPAR approval, and the aircraft must be damaged or worn beyond economical repair. (**NOTE:** Repair price must normally exceed 50 percent of the national average retail selling price to be considered beyond economical repair.)

**2.3. HQ AFSVA/SVPAR Loaned Aircraft.** Clubs are authorized excess aircraft obtained from the General Services Administration (GSA) according to AFI 34-217. HQ AFSVA/SVPAR must approve each aircraft before it is transferred for loan.

2.3.1. Gaining clubs are responsible for all acquisition costs and needed repairs.

2.3.2. Gaining managers shall:

- Ensure aircraft are registered and maintained in an airworthy condition according to FARs.
- Create and maintain aircraft and engine logbooks according to FAA directives.
- Notify HQ AFSVA/SVPAR when a loaned aircraft is destroyed, damaged beyond economical repair, or no longer needed.

2.3.3. HQ AFSVA/SVPAR will either reassign excess aircraft or transfer them to the Defense Reutilization and Marketing Office. (**NOTE:** Salvage is permitted only with HQ AFSVA/SVPAR approval.)

**2.4. Aircraft and Engine Parts.** The Air Force supply system is a potential source for replacement parts. Parts can be obtained on a reimbursable basis if excess to operational requirements. The use of Air Force procured items and spares is authorized according to AFMAN 23-110. Each request for replacement parts will include the following statement: "This material is for the \_\_\_\_\_ Air Force Base Aero Club".

2.4.1. Procedures for turning in excess government property are detailed in AFMAN 23-110. Procedures for turning in excess NAF property are detailed in AFI 34-404, *Services Logistics Support Program*.

2.4.2. Government-owned engines on loan to clubs may be exchanged for new, remanufactured, or factory overhauled engines of the same type, model, and series.

**2.5. Authorized Inventories.** Managers shall maintain a stock of spare parts to minimize aircraft down time. This stock includes items which have a high turnover rate (such as spark plugs, light bulbs, and tires) and items which are not readily available (such as flight instruments.) The manager establishes and adjusts inventory levels based on consumption rates and cost effectiveness. The objective is to establish a stock large enough to meet operational needs, yet small enough to control and manage with minimum cost.

2.5.1. Managers are not required to inventory spare parts with a fair market value less than \$50.00; however, it is advisable to maintain bin cards or other stock records for re-ordering. This also includes low cost hardware items such as nuts, bolts, screws, gaskets, lubricants, hoses, etc. Spare parts with a fair market value of over \$50.00, as well as aviation fuel, aircraft engine oil, and other lubricants, will be secured in a decentralized storeroom inventory.

**2.6. Registering Aircraft.** Clubs will use the name of the NAFI (e.g., Randolph AFB MWR Fund) as the owner for NAF-purchased aircraft; the US Air Force as the owner and the club as the operator for HQ AFSVA/SVPAR loaned aircraft.

## Chapter 3

### OPERATIONS

**3.1. SOP.** Managers shall publish and provide each member a copy of the SOP. The purpose of the SOP is to consolidate information on membership responsibilities, local airfield procedures, and operational restrictions and requirements. The SOP shall be detailed enough that a pilot with adequate knowledge of the FARs can read the SOP and Pilot Information File (PIF) and have the information needed to operate club aircraft at that location. The SOP shall not reiterate regulatory guidance in the FARs unless needed for clarification. As a minimum, the SOP shall contain the items described in **Attachment 2**. Items impacting flight operations will be coordinated with the applicable installation operations staff.

3.1.1. Managers shall update the SOP as necessary by removing and replacing existing pages and post a status page of the current SOP edition and changes in the PIF.

**3.2. PIF.** The PIF is designed to ensure the pilot is properly prepared for each flight. The PIF shall be a single binder, maintained in an accessible location, consisting of information pertinent for safe flight but not yet covered in the SOP.

3.2.1. Managers shall number each PIF item sequentially by calendar year (96-1, 96-2, etc.) and move items of a permanent nature to the SOP. As a minimum the PIF shall include each of the following:

- Items affecting flight operations or safety.
- Applicable local interest items.
- Initial and final aero club mishap message reports including HQ AFSVA/SVPAR or Air Force Safety Center (AFSC) reviews for the previous 12 months.
- Information items directed by higher headquarters.
- The latest flying safety meeting minutes.

3.2.2. Pilots shall ensure they have read all current PIF items before flight. Initial review of each PIF item shall be documented on the AF Form 654, **PIF Currency Card**.

**3.3. Documents and Publications.** Clubs shall maintain a reference library of flight planning documents/publications suited to the club's operating scope, applicable maintenance manuals, and aircraft handbooks or flight manuals for each make and model aircraft operated. Managers shall offer for sale copies of the manufacturer's information handbooks for each aircraft operated.

3.3.1. Managers shall establish flight publications requirements through the base flight publication distribution sections on a non-reimbursable account. Reference material shall include the *Aeronautical Information Manual (AIM)*, applicable *Airport Facility Directories*, FARs Part 61, 91, and 141, Enroute Low Altitude Charts, Low Altitude Instrument Approach Procedures, Class B Airspace Charts, and Sectional Charts.

3.3.2. Base supply shall make available to the club the supply publications and documents needed to identify Air Force items desired. The base Publications Distribution Office shall provide the club with Air Force technical orders for maintaining and using government-loaned aircraft and equipment when these publications are available in the Air Force publishing system.

**3.4. Local Flying Area.** The installation commander shall determine boundaries of the local flying area based on terrain, special use airspace, and available airports; a 50 nautical mile radius is recommended. The local area for solo student pilots shall be according to FARs. Managers shall develop a local area map depicting local area limits, training areas, ingress/egress routes, and the local traffic patterns. This map shall be prominently displayed in the flight planning area.

**3.5. Pilot-In-Command (PIC).** Only club members, employees, or aero club contractors possessing a valid FAA pilot certificate and who have successfully completed the applicable checkout requirements may pilot club aircraft. The HQ AFSVA/SVPAR aero club program manager/director are authorized to act as PIC of any club aircraft in which they maintain currency, without a local checkout.

3.5.1. Members possessing only a valid Recreational Pilot Certificate shall not act as PIC of club aircraft except when enrolled in a course of training for a Private, Commercial, or Airline Transport Pilot (ATP) rating. In this instance a member holding a Recreational Pilot Certificate shall comply with all restrictions in the FARs, and this manual, pertaining to student pilots.

3.5.2. The PIC shall occupy the left front seat in side-by-side aircraft or the front seat in tandem aircraft, except in any of the following circumstances:

- When prohibited by the flight manual.
- When weight and balance considerations dictate otherwise.
- When a pilot is enrolled in an instructor pilot training program and has been endorsed by a flight instructor for solo flight in either seat, flying under visual flight rules in the local training area.
- When the pilot is a flight instructor flying under visual flight rules in the local training area.
- When the pilot is a flight instructor conducting flight instruction or receiving/administering flight checks

3.5.3. The Services commander or division chief may authorize a one-time flight for a prospective buyer of a club aircraft; however, a qualified instructor shall act as PIC.

3.5.4. No person shall operate or occupy a club aircraft unless he or she has executed an AF Form 1585. (NOTE: This requirement does not apply to FAA Inspectors performing official flight examinations.)

**3.6. Passengers.** The pilot is personally responsible for the safety and actions of his or her passengers.

3.6.1. HQ AFSVA/SVPAR and MAJCOM aero club program managers/directors, club chief flight instructors, managers, and base flight safety officers are not considered passengers when conducting training, standardization, or evaluation flights.

3.6.2. FAA Inspectors are not considered passengers when performing official flight examinations.

**3.7. Aircraft Scheduling.** Scheduling will be on a first come, first served, basis for daily flying. Managers shall establish cross country scheduling and approval procedures and include those procedures in the SOP.

**3.8. Required Equipment.** The PIC shall ensure appropriate survival and safety equipment for the intended operation area is onboard the aircraft. Base life support units shall issue survival equipment if

immediate operational needs do not preclude such use, and shall establish appropriate safety procedures for issued equipment.

3.8.1. The PIC shall ensure an FAA approved personal flotation device for each occupant is onboard the aircraft and readily accessible if the aircraft is operated over water, beyond gliding distance from land.

3.8.2. The PIC shall ensure adequate tie-down equipment is onboard if landing at an airport without tie-down equipment.

**3.9. Checklists.** Managers shall supply a consolidated aircraft checklist for each aircraft operated. Use of the checklist by pilots is mandatory. The checklist shall include the applicable items contained in the manufacturer's owner's manual; however, if the owner's manual does not adequately cover the items below, managers shall supplement procedures and include them in the checklist. As a minimum the checklist shall include each of the following:

- Normal procedures.
- Emergency procedures.
- Takeoff, climb, and landing data.
- Crosswind component chart (including locally established crosswind limits) .
- Cruise performance and fuel consumption.
- Applicable alternate airfield procedures, unless contained in local inflight guide.
- A *Warning* that reads "Improper leaning procedures will greatly reduce endurance" in the cruise section of the Normal Procedures checklist.

3.9.1. Use of locally developed inflight guides is highly encouraged.

**3.10. Clearance Procedures.** Clearing authorities shall clear all flights originating at the home field according to this manual, MAJCOM supplements, installation directives, and the SOP. The pilot shall complete and sign, and the clearing authority shall sign for approval, a written clearing checklist for all flights. (*NOTE:* The pilot is the clearing authority for all flights originating off-station.) Additionally, the following restrictions apply:

- All flights where a student pilot is flying solo shall be cleared by a flight instructor who is familiar with the student's capabilities.
- Only a clearance authority with an instrument rating may clear pilots departing on an Instrument Flight Rules (IFR) flight plan.

**3.11. Pilot Currency.** Pilots shall record all applicable currency items in their personal logbook. Computer files are authorized provided they contain all applicable currency information.

3.11.1. Managers or Chief Flight Instructors may credit pilot activities performed in other than club aircraft to satisfy currency requirements.

3.11.2. Pilots shall fly with, and receive a logbook endorsement from an instructor to regain any currency.

3.11.3. To act as PIC, pilots with less than 200 pilot hours shall have accomplished three takeoffs and landings within the preceding 60 days in each make and model aircraft they wish to fly. Pilots with



200 pilot hours, or more, shall have accomplished three takeoffs and landings in the preceding 90 days in each category and class aircraft they wish to fly.

3.11.4. Pilots who have not made 3 takeoffs and landings in a particular make and model aircraft within the preceding 6 months must accomplish a recurrency check for that make and model aircraft.

**3.12. Pilot Training.** Managers shall prepare and use a ground school and flight training curriculum certificated by the FAA under FAR Part 141 for training leading to the issuance of an initial Private, Commercial, or Instrument Certificate. All members training for the initial issuance of a Private, Commercial, or Instrument rating shall be enrolled in, and complete training under, a FAR Part 141 curriculum. All other flight and ground training courses not certificated under FAR Part 141 must be approved by HQ AFSVA/SVPAR before implementation.

3.12.1. Instructors will use the grading procedures detailed in **Attachment 3**.

3.12.2. Managers shall notify HQ AFSVA/SVPAR within 48 hours of receiving any FAA notice of discrepancies.

**3.13. Aircraft Checkouts.** Pilots shall satisfactorily complete a separate flight checkout, given by an instructor, for each make and model aircraft the member is authorized to fly. Pilots shall complete all checkouts in an aero club aircraft and demonstrate performance to the applicable standards in the *HQ AFSVA Instructor Standardization Guide*.

3.13.1. Managers shall establish a mountain flying training program. Pilots will not fly over mountainous terrain until this training has been satisfactorily completed and documented.

3.13.2. Flight checks shall include all items listed in the *HQ AFSVA Instructor Standardization Guide* and satisfactory completion will be documented on the AF Form 654.

3.13.3. A successful flight check administered by an FAA inspector or pilot examiner may be credited for applicable annual requirements if properly documented on the AF Form 1584 and approved by the manager.

3.13.4. The Chief Flight Instructor shall administer initial and annual flight instructor flight checks according to FAR Part 141.

3.13.4.1. An FAA Inspector shall administer all annual flight checks required by this manual to the Chief Flight Instructor. Annual requirements will only be credited if the FAA Flight Examiner completes the items prescribed in the *HQ AFSVA Instructor Standardization Guide* and documents completion on the AF Form 1584. If an FAA Inspector cannot accomplish the required evaluations, the Chief Flight Instructor from another USAF Aero Club, or the HQ AFSVA/SVPAR Aero Club Director of Operations may accomplish the required evaluations.

3.13.5. The following flight checks are required of each member desiring to obtain/maintain PIC privileges, and shall be administered by a club flight instructor:

- Initial check in each make and model aircraft.
- Initial night Visual Flight Rules (VFR) local check.
- Initial and annual instrument flight check for members desiring IFR privileges.
- Initial and annual flight check in the most complex aircraft in which the pilot maintains currency.

- Initial formation flight check for those members desiring to fly aero club aircraft in formation.

**3.14. Knowledge Examinations.** Pilots must satisfactorily complete a written test for the following:

- Initial and annual standardization.
- Initial and annual instrument.
- Individual make and model aircraft (Open & Closed Book).
- Initial and annual instructor.
- Student pre-solo.
- Student pre-cross country. (**NOTE:** Waived if the student has successfully completed the FAA Private Pilot Knowledge Examination.)

3.14.1. Examinations issued by HQ AFSVA shall be used in lieu of locally developed examinations

3.14.2. Initial/Annual Standardization and Instrument exams are valid until the end of the 12th month following the month in which the exam was taken.

**3.15. Refueling.** The pilot shall ground the aircraft prior to fuel servicing operations by bonding the aircraft to the refueling equipment with an approved cable before making any fueling connection to the aircraft. The ground shall be maintained until fueling connections have been removed. The pilot bonds the nozzle with a nozzle bond cable having a clip or plug to a metallic component of the aircraft that is metal-lically connected to the tank filler port. The bond connection shall be made before the filler cap is removed. If there is no plug receptacle or means for attaching a clip, the pilot shall touch the filler cap with the nozzle spout before removing the cap. The spout shall be kept in contact with the filler neck until the fueling is completed. (**NOTE:** Refer to *National Fire Code 407* for further guidance.)

3.15.1. Aircraft may be refueled by a single operator if the requirements of the preceding paragraph have been satisfied.

3.15.2. If wearing Nomex flight clothing, the operator shall assure grounding by bare hand contact with the aircraft grounding connector, an unpainted aircraft surface, or a static ground before removing the fuel filler cap or while inserting the ground cable jack on the fuel nozzle.

3.15.3. No active ignition sources are permitted within 50 feet of an aircraft being refueled. No pre-flight involving energized electrical systems, engine starts, or maintenance of aircraft parked within 50 feet of the refueling operation is permitted.

**3.16. Flight Restrictions.** The following restrictions and requirements apply to all club pilots operating club aircraft.

**3.16.1. Weather Minimums:**

3.16.1.1. Day VFR minimums are 1,500 foot ceiling and 3 miles visibility.

3.16.1.2. Night VFR minimums are 2,500 foot ceiling and 5 miles visibility.

3.16.1.3. Weather minimums for IFR takeoff shall be no lower than the lowest compatible circling minimums, both ceiling and visibility, at the departure airport or the takeoff minimums listed in the Terminal Flight Information Publication for the airport, whichever are greater. (**NOTE:** Pilots with over 100 hours actual instrument time logged as PIC may takeoff when the weather is

at or above the lowest compatible approach minimums at the departure airport or the takeoff minimums listed in the Terminal Flight Information Publication for the airport, whichever are greater.)

3.16.1.4. Pilots shall comply with maximum crosswind components for each pilot rating and make and model aircraft posted in the aircraft checklist.

3.16.1.5. Flight will not be initiated if surface winds are forecast to be greater than 30 knots, and flights will be terminated as soon as practicable if surface winds exceed 30 knots.

3.16.1.6. Flight under special VFR, as defined in FAR Part 91, is limited to pilots with a current instrument rating, in an aircraft certified for instrument flight, and only at an altitude that assures terrain clearance established in paragraph 3.16.7 of this manual.

3.16.1.7. Simulated emergency training is limited to Visual Meteorological Conditions (VMC).

3.16.1.8. Managers shall establish minimum Runway Condition Reading (RCR) criteria for aircraft, to include maintenance ground run operations.

**3.16.2. Night Flight.** The following shall not be performed at night:

- Aerobatics.
- Unusual attitudes, stalls, approach to stalls, or flight at minimum controllable airspeed, except as required by an FAR Part 141 approved syllabus of instruction, with an instructor that is qualified to act as PIC under instrument conditions in the aircraft used for the flight.
- Operations at airports without runway lighting.
- Visual or non-precision approaches to runways outside the local training area without visual glide path guidance.
- Simulated emergency training, to include forced landings, except to lighted runways.
- Flight outside the local area unless the flight is operated under IFR, or the flight is required to be conducted under VFR by an approved syllabus of instruction and the instructor is qualified to act as PIC under instrument conditions in the aircraft used for the flight.
- Local VFR night flight, unless the pilot has logged at least 50 hours as PIC and maintains visual contact with an airport approved for night operations or holds a current instrument rating.
- Simulated night instrument practice in the local area unless a second pilot, with night currency in the aircraft being flown is onboard as a safety observer and has access to the flight controls.

**3.16.3. Passengers:**

3.16.3.1. Pilots shall not allow any passengers to be carried onboard the aircraft unless the passengers have completed an AF Form 1585. (**NOTE:** Executed forms shall not be carried onboard the aircraft, and this form must be re-executed at least every twelve months).

3.16.3.2. A parent or legal guardian shall execute the document on behalf of any person under 21 years of age. (**NOTE:** If the individual is an emancipated minor, the sponsoring member shall execute the document.)

3.16.3.3. Passengers are not authorized during training flights except when approved by the manager or chief flight instructor and an instructor is occupying one of the pilot positions.

3.16.3.4. Passengers are not authorized during qualification check flights.

3.16.3.5. Simulated emergency procedures are not permitted on any passenger flight except when an instructor occupies a pilot's position, the passengers are applicants enrolled in the same training course, and the Chief Flight Instructor determines the training will benefit all applicants onboard the aircraft.

3.16.3.6. Each passenger shall occupy a seat with an individual seat belt; children under 4 years old or less than 40 pounds shall occupy a Department of Transportation approved infant/child seat restrained by an individual seat belt.

#### **3.16.4. Duty Day Restrictions:**

3.16.4.1. Maximum aero club duty day is 12 hours for a single pilot or 16 hours for two qualified pilots in an aircraft with dual flight controls.

3.16.4.2. Flight duty day begins when the pilot reports to the aero club for the first flight, or to the duty location (place of employment) for the first duty (work) of the day; whichever occurs first.

3.16.4.3. Minimum crew rest between duty days is 10 hours after 8 hours or less of duty time, 12 hours for more than 8 hours duty time.

#### **3.16.5. Flight Plans.**

3.16.5.1. Pilots shall file a flight plan for all flights outside the local area.

3.16.5.2. Before filing to a military field, contact the destination base operations and aero club (if applicable) to ensure they can accept the aircraft, and obtain a Prior Permission Required (PPR) number if required. (**NOTE:** Enter the statement "Aero Club Aircraft, please advise \_\_\_\_\_ Base Operations" in the remarks section of the flight plan.)

3.16.5.3. When departing a military base other than home station the pilot shall file a flight plan with the local base operations.

#### **3.16.6. Approved Airports/Runways/Taxi Procedures.**

3.16.6.1. Pilots shall not perform straight-in VFR approaches to uncontrolled airports (**NOTE:** This does not apply to practice instrument approaches being flown under radar control when the safety pilot is able to simultaneously monitor approach control and the Common Traffic Advisory Frequency (CTAF) and make appropriate position calls on the CTAF.)

3.16.6.2. Pilots shall self-announce pattern position on crosswind, downwind, base, and final leg using the phraseology recommended in the *Aeronautical Information Manual*.

3.16.6.3. Pilots shall only land at active airports listed in National Oceanic and Atmospheric Administration (NOAA) or DoD flight information publications, or those designated by the installation commander. (**NOTE:** If an emergency or a precautionary landing is made at an unauthorized location, the pilot shall not takeoff without the club manager's approval.)

3.16.6.4. Pilots shall not takeoff or land on runways less than 2,000 feet long, or the sum of the aircraft takeoff and landing roll, whichever is greater.

3.16.6.5. Pilots shall not takeoff or land on runways less than 50 feet wide.

3.16.6.6. Pilots shall overfly (500' Above Ground Level (AGL) minimum) an uncontrolled airfield with unknown runway surface or approach conditions before landing. (*NOTE:* Not applicable to actual instrument approaches.)

3.16.6.7. Pilots shall not accomplish takeoff or landing rolls across raised arresting cables and use minimum speed if the aircraft must taxi over arresting cables.

3.16.6.8. Pilots shall not taxi within 10 feet of an obstacle unless designated taxi lines, suitable for the make and model aircraft being operated, are used.

3.16.6.9. Pilots shall not exceed 5 MPH taxi speed in congested areas.

### **3.16.7. Minimum Altitudes.**

3.16.7.1. Pilots shall not fly below 1000 feet AGL (2000 feet in designated mountainous terrain) unless required by specific regulation, airspace restriction, for takeoff or landing, or when accomplishing requirements directed by an approved syllabus of instruction.

3.16.7.2. Pilots shall not descend below 500 feet AGL during practice simulated forced landings, except to approved runways.

3.16.7.3. Pilots shall ensure proper engine operation at least every 500' when performing simulated engine failures in single engine aircraft.

3.16.7.4. Pilots shall not conduct aerobatics maneuvers below 2,500 feet AGL.

3.16.7.5. Pilots shall not perform stalls, turns over 45 degrees of bank, slow flight, or unusual attitudes below 1,500 feet AGL in single engine aircraft.

### **3.16.8. Multi-Engine Aircraft.**

3.16.8.1. Pilots shall not perform stalls, turns over 45 degrees of bank, slow flight, or unusual attitudes below 3,000 feet AGL.

3.16.8.2. Engine failures shall not be simulated on the runway at an airspeed greater than 1/2 VMC and only if the aircraft is still on the runway with sufficient runway remaining for a normal stop.

3.16.8.3. Instructors may accomplish simulated engine failure during climb-out in multi-engine aircraft by retarding a throttle, but not below 500 feet AGL nor below recommended VSSE or VYSE, whichever is greater.

3.16.8.4. Feathering of one propeller shall only be demonstrated above 3,000 feet AGL and in a position where a safe landing can be accomplished on an approved runway should difficulty be encountered in unfeathering the propeller.

3.16.8.5. Simulated engine failure, while airborne, below 3,000 feet AGL shall only be performed by retarding the throttle of the selected engine.

3.16.8.6. Simulated single engine go-arounds shall not be initiated or continued below 500 feet AGL.

**3.16.9. Smoking** is prohibited in or within 50 feet of club aircraft.

**3.16.10. Formation Flight:**

3.16.10.1. Pilots shall not conduct formation flights without the installation commander's approval. (**NOTE:** The installation commander may delegate this authority to the manager, and a copy of this delegation authority must be maintained in the SOP.)

3.16.10.2. Pilots shall not conduct formation flight unless they have satisfactorily completed a formation checkout.

#### **3.16.11. Student Pilots:**

3.16.11.1. Solo student pilots shall not fly when the crosswind component exceeds 10 knots.

3.16.11.2. Solo student pilots shall not perform touch-and-go landings.

3.16.11.3. Student pilots shall not fly more than 10 hours solo or exceed 30 days without a dual proficiency flight. This flight will include all items listed in FAR Part 61.87 (d) and (e).

3.16.11.4. Student pilots shall not fly solo at night.

3.16.11.5. Solo student pilots shall not conduct simulated forced landings.

3.16.11.6. The Chief Flight Instructor shall develop standard training cross-country routes. Only the Chief Flight Instructor may authorize the use of other routes.

3.16.11.7. All dual portions of supervised solo flights shall include three student landings and one go-around at the airfield where the student will solo. Instructors shall ensure adequate student proficiency and be present at the airport during the solo portion of the flight. Prior to a student pilot's first unsupervised solo flight, the student pilot must have completed a satisfactory flight check with the Chief or Assistant Chief Flight Instructor.

3.16.11.8. On the first two solo cross country flights, students shall fly to airfields where they have previously demonstrated satisfactory traffic patterns to an instructor. Students may then fly the remainder of the solo cross-country requirements to other airports approved by the Chief Flight Instructor.

#### **3.16.12. Fuel Reserves:**

3.16.12.1. Pilots shall not begin a flight unless there is sufficient fuel to complete the flight to the point of intended landing, fly from that airport to an alternate (if an alternate is required), and then fly after that for at least 1 hour at normal cruise consumption.

3.16.12.2. For flight planning purposes, the PIC shall calculate fuel consumption using the aircraft or engine manufacturer's data, whichever is greater.

#### **3.16.13. Other Restrictions.**

3.16.13.1. Pilots shall not use club aircraft for towing gliders or sail planes.

3.16.13.2. Pilots shall not use club aircraft for parachuting or sky diving.

3.16.13.3. Club members shall not use club aircraft for commercial purposes.

3.16.13.4. Pilots shall compute takeoff distances for each flight, check actual aircraft performance against computed data, and abort the takeoff if aircraft performance is inadequate.

3.16.13.5. Pilots shall calculate weight and balance data for each flight.

3.16.13.6. Pilots shall not takeoff with snow or frost on the aircraft.

## Chapter 4

### SAFETY

**4.1. Safety Meetings.** Currency in aero club aircraft is conditioned upon attendance at safety meetings. A member who fails to attend a required meeting shall be denied flying privileges until he/she reviews the meeting minutes or receives a briefing from the club safety officer or designated representative. The manager or a designated representative shall document safety meeting attendance and/or the makeup briefing on the AF Form 654. A member who misses two consecutive meetings without a valid reason shall be denied flying privileges until they attend a safety meeting. A member who misses three consecutive meetings must attend a safety meeting prior to regaining flying privileges.

4.1.1. The installation commander may authorize members to view a video tape of the safety meeting to satisfy attendance requirements.

4.1.2. The manager may authorize attendance at another military aero club's safety meeting to satisfy attendance requirements.

4.1.3. Safety meeting format is up to the discretion of the Safety Officer; however, the following topics are recommended for periodic discussion:

- Air Force and MAJCOM policies and directives.
- FARs.
- Local flying area topics, including briefings by safety specialists or representatives from the local FAA office.
- Midair collision prevention.
- Seasonal flying hazards, including weather.
- Light aircraft maintenance and potential problem areas.
- Light aircraft accident briefs.
- Wake turbulence, flight planning, and fuel management.
- Lost and emergency procedures.
- Spatial disorientation, survival, hypoxia, and effects of medication.
- Mountain flying.
- All aero club mishap reports.

**4.2. Fire Extinguishers.** Fire extinguishers shall be readily accessible during engine starts, aircraft maintenance, and aircraft refueling. Local fire protection authorities shall determine the amount, locations, and types of fire extinguishers to be used.

**4.3. Flight Clothing.** Pilots are encouraged to wear Nomex clothing, particularly gloves, while flying. Wear of synthetic materials such as nylon and polyester next to the skin is strongly discouraged.

**4.4. Air Force Occupational Safety and Health (AFOSH) Standards.** Clubs shall comply with applicable portions of AFOSH standards.

**4.5. Disciplinary Action/Retraining.** Managers shall deny flying privileges to any pilot involved in an accident, incident, unusual occurrence, or in actions which may be perceived as a violation of established directives, until a reasonable determination of the facts can be made and the pilot's aero club privileges are reinstated by the installation commander.

4.5.1. The club safety officer shall investigate the event to determine if the pilot knowingly violated established regulations/procedures, and/or whether the pilot should receive additional training. The safety officer will present his/her findings to the standardization board. The standardization board will make recommendations to ensure this event does not reoccur and forward those recommendations through the manager to the installation commander for approval.

4.5.2. If the installation commander determines the pilot(s) knowingly violated FARs, AFI 34-217, this manual, NTSB statutes, or SOPs, the pilot shall be removed from the club. (**NOTE:** "Knowingly" shall be interpreted to mean a similarly experienced pilot, in a similar situation, would have known the actions were in violation of established directives). The pilot will not be eligible to reapply to any USAF Aero Club for a period of at least 1 year.

4.5.2.1. Managers will forward copies of the events and the approved recommendations to HQ AFSVA/SVPAR detailing those events which lead to member dismissal.



## Chapter 5

### MAINTENANCE

**5.1. General Maintenance Information.** Managers ensure aircraft records are maintained according to manufacturer's maintenance manuals and FAA directives. Managers establish a program of scheduled inspections, routine maintenance, and component overhauls, and develop a maintenance/inspection procedures manual according to FAA Advisory Circular 145-3.

5.1.1. The maintenance program must ensure no one operates any aircraft with a discrepancy that would make the aircraft non-airworthy.

5.1.2. 100 Hour inspections prescribed by FAR 91.409 are required for all aero club aircraft operations.

5.1.3. Managers will document the circumstances resulting in any overflight of an Annual or 100 hour inspection.

5.1.4. Managers shall notify HQ AFSVA/SVPAR within 48 hours of receiving any FAA notice of maintenance discrepancies.

### **5.2. Time Between Overhaul (TBO).**

5.2.1. Overhaul aircraft components at the manufacturer's recommended TBO.

5.2.2. If engines meet airworthiness standards at TBO, managers may delay overhaul until TBO plus 20 percent, provided they conduct actions prescribed by FARs for 100-hour inspections every 50 hours. (**NOTE:** Effective 1 Mar 1997, the requirement for overhaul will be accomplished by obtaining an engine from a supplier designated by HQ AFSVA/SVPAR.)

**5.3. Compliance With Manufacturer's Service Bulletins.** Unless specifically exempted or modified by HQ AFSVA/SVPAR, clubs shall complete all actions directed by manufacturer's mandatory service bulletins.

**5.4. Grounding an Aircraft.** Any club pilot shall ground an aircraft, if in the pilot's opinion, the aircraft is not airworthy. Pilots shall document grounding on AFTO 781A, **Maintenance Discrepancy And Work Document** (or equivalent), and the aircraft shall not be operated until released by a club Airframe and Powerplant mechanic.

**5.5. Maintenance Records.** The manager, with assistance from the maintenance officer, ensures aircraft maintenance records are maintained according to applicable FARs. Minor unscheduled maintenance shall be recorded on an AFTO Form 781A or equivalent substitute. As a minimum, the AFTO Form 781A substitute shall have discrepancy, corrective action, and certification sections. All corrective actions shall be certified by the individual performing the repair/inspection. (**NOTE:** Technical Orders Series 00-20 do not apply to the maintenance of these forms, and use of other AFTO forms in the 781 series is optional.)

5.5.1. The AFTO Forms 781A, or its substitute, are maintained in 100 hour increments between required inspection cycles, and maintained for the previous 200 hours of operation. When these records exceed the 200 hour retention requirement, dispose of them in 100 hour increments according to AFI 37-138.

5.5.2. If club mechanics perform aircraft maintenance, the club shall maintain a technical library containing, as a minimum, the following:

- Aircraft, engine, and propeller service manuals.
- Airworthiness directives, service letters, and service bulletins for each make and model aircraft maintained.
- All applicable FARs and ACs (ex. FARs 23, 39, & 43; AC 43 Series).

5.5.3. Logbooks entries shall contain reference to the manufacturers service manual, or other technical data acceptable to the FAA Administrator, used to complete all maintenance performed and the part number(s), and serial number(s) if applicable, of all parts installed during the maintenance process.

5.5.4. All date entries in shall use be made using a two number day, 3 letter month, and 2 number year format (ex. 15 Sep 96)

**5.6. Maintenance Status Boards.** The manager shall ensure current maintenance is available to the pilot in the aircraft, containing as a minimum:

- FAA registration number.
- IFR/VFR Capable.
- Status (Operational/Grounded).
- Time next overhaul is due for engine(s) and, if applicable, propeller(s).
- Date the annual inspection is due.
- Time the 100 hour inspection is due (50 hours for aircraft engines over TBO).
- Time oil change is due.
- Dates other FAR Part 91 inspections are due.
- Date the ELT battery is due replacement or change.

**5.7. Using Base Facilities.** Aero clubs may use base maintenance and repair facilities when authorized by the appropriate commander.

**5.8. Aircraft Parts.** Managers will ensure all aircraft parts are labeled as to serviceability according to FAA Advisory Circular 145-3. The use of DD Forms 1577, **Unserviceable (Condemned) Tag-Material**, 1577-2, **Unserviceable (Reparable) Tag-Material**, and 1574, **Serviceable Tag-Material**, are authorized for this purpose.

**5.9. Precision Measuring Equipment.** Managers will ensure all precision measurement tools are calibrated at least annually according to guidelines established in FAR part 145.

**5.10. Service Difficulty Reports (SDR)/ Malfunction Defect Reports (MDR).** Clubs will forward a copy of all SDRs/MDRs to HQ AFSVA/SVPAR for trend analysis.

**5.11. Functional Check Flights (FCF) .**

FCFs are required for aircraft being returned to service after having undergone alterations or repairs which, in the opinion of the Chief of Maintenance could:

- Alter the flight characteristics of the aircraft.
- Affect the navigation systems of the aircraft.
- Adversely affect the operability of aircraft systems and cannot be adequately ground tested.

5.11.1. Managers will designate the most qualified instructor pilots to perform FCFs of aircraft being returned to service following maintenance. The number of FCF pilots designated shall be kept to a minimum.

**5.12. Deferred Maintenance.** The manager will be the final authority for approving those discrepancies the Chief of Maintenance has determined may safely be deferred until the next scheduled inspection. Discrepancies the Chief of Maintenance does not think can be deferred shall be considered grounding items.

**5.13. Tool Control Program.** The Chief of Maintenance will develop procedures to insure tools are not inadvertently left inside aircraft during maintenance. These procedures shall be included in the maintenance procedures manual.

**5.14. Maintenance Training.** The Chief of Maintenance will develop, conduct and document initial training for all NAF employee aero club mechanics; and require documentation that contract aero club mechanics have received such training. As a minimum this training shall include:

- OSHA/AFOSH Requirements.
- Tool Control Procedures.
- Maintenance Documentation.
- Engine ground run/taxi procedures for each aircraft operated.
- Familiarization with corrosion control procedures.

**5.15. Corrosion Control.** Aircraft shall be treated for corrosion according to AC 43-4, Corrosion Control For Aircraft. As a minimum, all flight control/trim surfaces, brackets, and mounting hardware shall be free of corrosion.

## Chapter 6

### WHAT PEOPLE DO

**6.1. Manager Responsibilities.** Aero Club Manager is responsible for all aspects of the club's operation. Managers shall conduct daily business according to applicable Air Force publications, FARs, NTSB statutes, AFI 34-217, this manual, and local directives.

6.1.1. Managers shall maintain the SOP, PIF, applicable Flight Information Publications, and other documents directed by this manual.

6.1.2. Managers shall maintain membership and training folders, flight currency, safety, and annual currency records.

6.1.3. Managers shall report accidents, incidents, unusual occurrences, or other pertinent safety information immediately to the Services commander or division chief, with a copy to MAJCOM representative, and HQ AFSVA/SVPAR according to Attachment 5.

6.1.4. Managers shall stop any club pilot, whether local or transient, from flying when, in the manager's judgment, flight safety may be compromised.

6.1.5. Managers shall suspend membership privileges of any member suspected of having engaged in negligent acts, willful misconduct, drug abuse, or alcohol abuse. Suspension will remain in force pending installation commander evaluation. While under suspension the member shall not be required to pay dues. Managers shall forward results of suspension and/or revocation actions signed by the installation commander through the MAJCOM to HQ AFSVA/SVPAR and inform the FAA if certification review is warranted.

6.1.6. Managers shall monitor contractors to ensure compliance with contract provisions and report substandard performance to the Services commander or division chief.

6.1.7. Managers shall designate a safety, operations, and maintenance officer to meet the requirements of this manual.

6.1.8. Managers shall designate a chief flight instructor who meets the requirements of FAR Part 141.

6.1.9. Managers shall retain instructors as employees or individual contractors. Employees may perform duties as flight instructors when their job descriptions include these duties; however, all fees and revenues from flight instructor duties shall go to the club. An employee whose job description does not include instructor duties may provide contract flight or ground instruction under contract for compensation during off-duty hours.

6.1.10. Managers shall ensure personnel who lease aircraft to the club are not in a position to effect flight instruction or aircraft scheduling procedures for personal gain.

6.1.11. Managers shall ensure compliance with FAA maintenance directives, including Airworthiness Directives (AD) that apply to the aircraft operated.

6.1.12. Managers shall conduct frequent inspections of club maintenance facilities, with particular attention to inventories.

6.1.13. Managers shall ensure a positive means of securing unattended aircraft, and implement procedures to prevent members from flying an aircraft with an uncorrected discrepancy that may adversely affect safety of flight.

6.1.14. Managers shall ensure a quality assurance program is established for fuels, to include periodic replacement of filters, and inspection of fuel storage tanks and pumping equipment sumps for contamination. Commercial fuel vendors must meet the standards established by the American National Standards Institute, and fuel storage facilities must meet the standards prescribed by the National Fire Protection Association.

6.1.15. Managers shall establish and post crosswind limits for each make and model aircraft and pilot category.

6.1.16. Managers shall perform semi-annual cost analyses to ensure adequate rental rates. Managers shall recommend lower dues and initiation fees to the Services commander/division chief for additional family members or as a temporary recruiting initiative.

6.1.17. Managers shall complete the AF Form 270, **Aero Club Operations**, according to attachment 6.

6.1.18. Managers shall use base-level market data to support planned programs.

6.1.19. Managers shall account for aircraft, equipment, and supplies on loan or issued to aero clubs in accordance with AFMAN 23-110. Managers shall account for all equipment purchased from NAFs in accordance with AFI 34-401, *Use of Nonappropriated Funds (NAFs)*.

6.1.20. Managers shall obtain HQ USAF/ILV approval to conduct any events open to the general public, to include demonstration rides.

6.1.21. Managers shall develop a plan to recall, shelter, or evacuate aircraft in the event of hazardous weather advisories.

6.1.22. Managers shall track and correct any deficiencies noted during base-level inspections or evaluations.

6.1.23. Managers shall attend or designate an aero club member to attend all base-level flying safety meetings.

**6.2. Club Operations Officer Responsibilities.** The operations officer monitors club flying operations and works closely with base operations personnel, the commander's appointed operations representative, and the chief flight instructor to ensure compliance with the SOP.

**6.3. Club Safety Officer Responsibilities.** The safety officer conducts an aggressive aviation safety program. The safety officer works closely with the commander's appointed safety advisor, the MAJCOM safety point of contact, FAA Aviation Safety Program Manager, and AFSA to develop and maintain a rigorous and pro-active mishap prevention program. The safety officer should be a certificated flight instructor. The safety officer shall:

- Be alert to potential hazards and recommend changes in procedures to eliminate them.
- Maintain a safety bulletin board.
- Coordinate with appropriate agencies to correct safety deficiencies discovered during inspections.

- Ensure safety meeting minutes, mishap reviews, and mishap report messages are promptly posted in the PIF. (**NOTE:** Safety officers shall obliterate all references to pilot identification, specific location, or identification of aircraft before posting.)
- Conduct safety meetings and prepare minutes for members' review. (**NOTE:** Videotaped meetings can replace safety meeting minutes provided the video is kept on file for 1 year.)
- Post minutes in the PIF within 5 workdays after each meeting.
- Notify the wing safety office of all aero club safety and standardization board meetings.

**6.4. Club Maintenance Officer Responsibilities.** The Maintenance officer monitors the maintenance program and ensures an aggressive, pro-active approach is taken to identify, correct, and prevent aircraft discrepancies. The maintenance officer works closely with the commander's appointed maintenance advisor and club mechanics to maintain a rigorous quality control program. The maintenance officer should have a background in aircraft maintenance gained from military or civil aviation. FAA Airframe and Powerplant (A&P) mechanic's certificate is desirable.

**6.5. Chief Flight Instructor Responsibilities.** The Chief Flight Instructor shall:

- Direct all flight training and checkout activities according to FARs Part 61, 91, and 141, AFI 34-217, AFMAN 34-232, USAF Aero Club Instructor Standardization Guide, and the SOP.
- Make applicant/instructor assignments.
- Develop standardized flight check procedures.
- Chair the standardization board meetings.
- Appoints assistants according to FAR Part 141, as needed for each course of instruction.
- Stop any club pilot, whether local or transient, from flying when, in the Chief Flight Instructor's judgment, flight safety may be compromised.

**6.6. Flight Instructor Responsibilities:** The flight instructor:

- Stops any club pilot, whether local or transient, from flying when, in the instructor's judgment, flight safety may be compromised.
- Acts as PIC of the aircraft while conducting flight instruction.
- Maintains a valid FAA Second Class Medical Certificate
- Assists the chief flight instructor, as required, in developing training and checkout procedures.
- Conducts training and checkouts according to AFMAN 34-232, USAF Aero Club Instructor Standardization Guide, the SOP, and applicable FARs.

**6.7. Chief of Maintenance Responsibilities.** The Chief of Maintenance:

- Coordinates the scheduling and priority of all maintenance activities.
- Performs aircraft maintenance.
- Supervises aero club mechanics.
- Establishes and maintains the maintenance technical library.
- Manages the maintenance parts inventory.

- Ensures environmental and AFOSH standards are met.

**6.8. Member Responsibilities.** Members shall comply with all applicable directives and operate club aircraft in a safe and prudent manner consistent with Air Force, FAA, and the aircraft manufacturer's guidance. (*NOTE:* Operations that damage aircraft can lead to assessment of pecuniary liability under AFI 34-402, *Protecting Nonappropriated Fund Assets*, examples include; failure to follow checklist procedures, disregarding operating restrictions, flying while out of currency, and careless or reckless operations.)

6.8.1. Members shall:

- Pay established dues.
- Assist the manager or other club officials in daily club operations when requested.
- Present their log books, pilot certificate, and medical certificate to the manager, chief flight instructor, or clearing authority for examination upon request.
- Attend scheduled flight safety meetings.

6.8.2. Be authorized to exercise PIC privileges in an aircraft belonging to another Air Force aero club if each of the following requirements are met:

- The visiting pilot shows proof of good standing and active membership in a military aero club (*NOTE:* Visiting members are not charged initiation fees or monthly dues unless the visit exceeds one billing period at their home club, then members must pay dues at either their home or the visiting club.)
- The visiting pilot complies with all the host club regulations and pilot qualification requirements.
- The manager or designated representative verifies membership and currency prior to the visitor flying (*NOTE:* Visiting pilots should hand-carry their membership and training folder to the club where the member is requesting flying privileges.)
- The visitor receives a complete local area briefing by a host club instructor (*NOTE:* The club SOP may require a local area checkout flight.)

**6.9. Standardization Board Member Responsibilities.** The standardization board is chaired by the Chief Flight Instructor, composed of all flight instructors, clearing authorities, the operations and safety officers, the installation operations and safety advisors and is responsible to the manager for standardizing the club's flying activities, to include:

- Checkout procedures and performance requirements.
- Annual flight checks.
- Training curricula, methods and techniques.
- Identifying applicant/member weaknesses and trends.
- Flight clearing procedures.
- Training folders and currency records.
- Written tests.
- Local area procedures.

- SOP.

6.9.1. The standardization board shall make recommendations, through the manager, to the Installation Commander on matters of pilot discipline. If any member of the board is directly or indirectly involved in the incident, that member will not participate in the board's deliberations or recommendations. (**NOTE:** Indirect involvement includes instances where the board member was acting as flight instructor, clearing authority, or in any other capacity whereby the board member's involvement in disciplinary recommendations could create the perception of impropriety.)

6.9.2. Meetings shall be conducted at least quarterly. Minutes shall be kept and forwarded through the manager to the Services commander or division chief for review.

**6.10. Clearing Authority Responsibilities.** The clearing authority is designated by the manager to dispatch aircraft according to this directive. The clearing authority must possess at least a valid Private Pilot Certificate and have logged a minimum of 200 pilot hours. The clearing authority must have a thorough understanding of this instruction, SOP, and applicable FAA regulations. The clearing authority shall ensure each of the following:

- The pilot is current, qualified, and prepared for the flight.
- The pilot has signed off applicable PIF items.
- The pilot and all passengers have completed an AF Form 1585.

**6.11. Forms Prescribed:**

6.11.1. AF Form 270, **Aero Club Operations**, paragraph 6.1.

6.11.2. AF Form 653, **Flight Currency Record (Aero Club)**

6.11.3. AF Form 654, **PIF/Safety/Annual Currency Record (Aero Club)**, paragraph 3.2.2.

6.11.4. AF Form 1584, **Pilot Checkout**, paragraph 1.6.

6.11.5. AF Form 1585, **Covenant Not to Sue and Indemnity Agreement**, paragraph 1.6.

6.11.6. AF Form 1710, **Membership Application** \_\_\_\_\_ **AFB Aero Club**, paragraph 1.6.

WILLIAM P. HALLIN, Lt Gen  
DCS/Installations & Logistics



## Attachment 1

### GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

#### *References*

AFI 34-201, *Services Programs and Use Eligibility*  
AFI 34-217, *Air Force Aero Club Program*  
AFI 34-401, *Use of Nonappropriated Funds (NAFs)*  
AFI 34-402, *Protecting Nonappropriated Fund Assets*  
AFI 34-404, *Air Force Services Logistics Support Program*  
AFI 34-408, *Property and Casualty Insurance*  
AFI 34-409, *Nonappropriated Fund Financial Management and Accounting Procedures*  
AFI 36-2833, *Safety Awards*  
AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*  
AFI 37-138, *Records Disposition--Procedures and Responsibilities*  
AFI 51-501, *Tort Claims*  
AFI 64-301, *NAF Contracting*  
AFI 65-106, *Appropriated Funds Support of Services Programs and NAF Instrumentalities*  
AFMAN 23-110, *USAF Supply Manual*  
AFMAN 34-232, *Aero Club Operations*  
AFPD 34-2, *Air Force Community Service Programs*  
Title 14, Code of Federal Regulations, *Aeronautics and Space*  
Title 49, Code of Federal Regulations, Part 800, *Notification and Reporting of Aircraft Accident or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records*  
Aeronautical Information Manual

#### *Abbreviations and Acronyms*

AFI—Air Force Instruction  
AFMAN—Air Force Manual  
AFPD—Air Force Policy Directive  
AFSA—Air Force Safety Agency  
AFSVA—HQ Air Force Services Agency  
AIM—Aeronautical Information Manual  
CC—Commander

**CTAF**—Common Traffic Advisory Frequency  
**DoD**—Department of Defense  
**DM**—Deferred Maintenance  
**FAA**—Federal Aviation Administration  
**FARs**—Federal Aviation Regulations  
**FCF**—Functional Check Flight  
**FSO**—Flight Safety Officer  
**FOUO**—For Official Use Only  
**GSA**—General Services Administration  
**HQ USAF/SV**—Headquarters Air Force Services  
**MAJCOM**—Major Command Services Commander  
**MANAGER**—The Appointed Aero Club Manager  
**NOAA**—National Oceanic and Atmospheric Administration  
**NTSB**—National Transportation Safety Board  
**OPR**—Office of Primary Responsibility  
**PIC**—Pilot in Command  
**PIF**—Pilot Information File  
**SOP**—Standard Operating Procedures  
**SV**—Services Commander/Division chief  
**SVPAR**—HQ AFSVA Community Programs Division  
**TDY**—Temporary Duty  
**TBO**—Time Between Overhaul  
**VA**—Veterans Administration  
**VSSE**—Intentional One Engine Inoperative Speed  
**VYSE**—One Engine Inoperative Best Rate of Climb Speed

***Terms***

***NOTE:***

All references to pilot certification and aircraft operations will be as defined by FARs.

**Applicant**—A member who is enrolled in course of training leading to the issuance of a pilot rating or certificate.

**Club**—Unless specified otherwise the term "club" refers to the aero club.

**Certificate**—The term "certificate" refers to a valid airman's certificate as defined by FARs.

**Instructor**—The term "instructor" refers to an FAA certificated Flight Instructor who has completed all checkout requirements prescribed by this manual and has been approved to conduct flight instruction by the manager. Additionally, an "instrument" instructor is one who holds a valid FAA Instrument Flight Instructor rating and has been approved to conduct instrument flight training by the manager.

**Manager**—Unless specified otherwise, the term "manager" refers to the appointed aero club manager.

**Month**—When used in conjunction with currency requirements, refers to the end of the calendar month.

**Pilot**—The term "pilot" refers to the individual acting as pilot-in-command of an aero club aircraft.

**Student**—Refers to an individual training for, but not yet certificated as a private pilot. This also applies to any individual holding a recreational pilot certificate, or another country or military certificate but does not yet hold a Private Pilot Certificate or higher.

## **Attachment 2**

### **FORMAT FOR STANDARD OPERATING PROCEDURES**

#### **Chapter 1: Administration**

- Membership application, resignation, and expulsion procedures.
- Quorums and meetings.
- Aircraft scheduling procedures.

#### **Chapter 2: Pilot Currency Requirements.**

#### **Chapter 3: Operational Restrictions and Local Area Procedures.**

- Restrictions and Requirements.
- Clearing Authority and Clearance Procedures.
- Lost Communications Procedures.
- Lost and Alternate Airfield Procedures.
- Weather Recall and Aircraft Evacuation Procedures.

#### **Chapter 4: Student Pilot Procedures.**

- This chapter should contain only restrictions and requirements applicable to student pilots.

#### **Chapter 5: Safety.**

- Accident / Incident Reporting Procedures.
- Ground Safety.

#### **Chapter 6: Maintenance Procedures.**

#### **Chapter 7: Flight Instructor Responsibilities.**

**Attachments: As Needed**

## Attachment 3

### GRADING PRACTICES

To ensure all instructors are grading against a uniform standard and the applicant's progress is assessed against his/her ability to meet the requirements of FAA Practical Test Standards (PTS) for the rating desired, the following grades shall be used on the applicant's training record:

#### Individual Maneuver Grade

**P = Proficient or Practical Test Standard.** The applicant meets the applicable FAA PTS for the individual maneuver without intervention or verbal assistance from the instructor.

**S = Safe.** While the applicant does not fully meet the PTS, he/she is able to consistently perform the maneuver safely, without instructor intervention or verbal assistance. The applicant is cleared to perform this maneuver solo.

**A = Accomplished.** Unsafe to perform solo. The applicant is unable to perform the maneuver without demonstration, intervention or verbal assistance from the instructor, or the applicant's relative experience makes it impossible to determine if he/she could perform the maneuver without assistance.

**D = Demonstrated Only.** This maneuver was demonstrated by the instructor. (**NOTE:** If the instructor demonstrated the maneuver and then allowed the applicant to perform it, the grade shall reflect the applicant's performance.)

**✓ = Accomplished While Solo.** Student pilots will place an individual "✓" in the appropriate box to indicate they performed the maneuver one or more times while solo.

#### **Overall Grade**

The following grades will be used to assess the students overall performance for the flight. If an applicant receives a grade of *below average* or *below acceptable standards*, the Chief Flight instructor shall review the applicant performance with the instructor prior to the applicant next flight.

**1 = Excellent.** The applicant's performance exceeded expectations given his/her phase of training, experience, etc.

**2 = Above Average.** The applicant's performance was above average given his/her phase of training, experience, etc.

**3 = Average.** The applicant's performance was average given his/her phase of training, experience, etc.

**4 = Below Average.** The applicant's performance was below average given his/her phase of training, experience, etc.

**5 = Below Acceptable Standards.** The applicant's performance was below average given his/her phase of training, experience, etc.

**NOTE:** An "individual maneuver" is anything other than the overall grade. The FAA PTS do not fully cover all maneuvers. The Chief Flight instructor shall supplement the PTS in instances where the PTS performance level is not specific or inadequate.

## Attachment 4

### PILOT CHECKOUT REQUIREMENTS

#### Single Engine Fixed Gear Aircraft

##### 200 Horsepower or Less:

- Airman's certificate (SEL): Student, Private, Commercial, or ATP
- Pilot Time: 0
- PIC time in aircraft with less than 200 horsepower: 0
- PIC time in make and model: 0

##### | Greater than 200 - 236 Horsepower <sup>2</sup>:

- Airman's certificate (SEL): Student, Private, Commercial, or ATP
- Pilot Time: 75 hours, or 50 hours in make and model
- PIC time in aircraft with 201 - 236 horsepower: 5, or 5 hours PIC in make and model, or completion of an approved training program of not less than 5 hours

##### 237 Horsepower or Greater:

- Airman's certificate (SEL): Private, Commercial, or ATP
- Pilot Time: 100 hours
- PIC time in aircraft with 237 horsepower or greater: 10, or 5 hours PIC in make and model, or completion of an approved training program of not less than 10 hours<sup>3</sup>

#### Single Engine Retractable Gear

##### 200 Horsepower or Less:

- Airman's certificate (SEL): Private, Commercial, or ATP
- Pilot Time: 125 hours
- PIC time in complex aircraft: 10, or 5 hours PIC in make and model, or completion of an approved training program of not less than 5 hours

##### | Greater than 200 Horsepower:

- Airman's certificate (SEL): Private, Commercial, or ATP
- Pilot Time: 125 hours

- PIC time in complex aircraft: 25, or 5 hours PIC in make and model, or completion of an approved training program of not less than 10 hours<sup>3</sup>

#### Multi-Engine Aircraft

##### All Horsepower Ratings:

- Airman's certificate (MEL): Private, Commercial, or ATP
- Pilot Time: 250 hours, of which 50 must be in complex aircraft
- PIC time in piston multi-engine aircraft: 25, or 5 hours PIC in make and model, or completion of an approved training program of not less than 10 hours<sup>3</sup>

#### Notes

1. These are the minimum requirements before a pilot begins the checkout course of instruction. For example, a pilot desires to fly a 230 HP complex single engine aircraft and has logged only 10 hours of complex time, of which 3 hours was in make and model. This pilot needs to complete the entire approved training course.
2. T-41C aircraft are considered in the 200 Horsepower or Less category.
3. Pilots may proficiency advance with the approval of the Chief flight Instructor; however, in no circumstances will the flight phase be less than 5 hours.



## Attachment 5

### MISHAP REPORTING PROCEDURES

In case of any aircraft accident or incident:

- Take whatever immediate action is necessary to provide emergency attention to protect life and prevent further injury to persons or damage to property.
- The police or security police should be notified if the loss involves any type of theft of property or any other criminal conduct. The NTSB should be notified when applicable under NTSB Part 830. Required forms should be completed and filed with the appropriate military and civilian authorities.
- Gather as much information as possible and contact HQ AFSVA and the MAJCOM POC with the following data:
  - Date of Occurrence.
  - Time Of Occurrence.
  - Aircraft Registration Number.
  - Aircraft Make and Model.
  - Group I, II, or III Aircraft.
  - Aircraft Year.
  - Location of Mishap.
  - Current Location of the Aircraft.
  - Pilot's Name (civilian/Active Duty).
  - Passengers Name (Civilian/Active Duty).
  - Injuries Sustained.

#### NOTES:

*Do not delay reporting while awaiting more complete details, you can send additional information later.*

- In the event an accident occurs, **immediately** copy all aircraft and pilot logbook data. The NTSB could impound these records and they will be required for us to assist you in any investigation.

#### Accident/Incident Reporting

In the event of an aircraft accident or incident, make the following telephone notifications:

- In the event of an aircraft **accident**, or any bodily injury, make the following notifications immediately, regardless of the time of day or night:
  - Notify HQ AFSVA/SVPAR (Aero Club Program Manager)
  - Duty Hours: DSN 487-4979
  - Commercial: 210-652-4979
- If after duty hours and you cannot reach HQ AFSVA/SVPAR, report the information to the USAF Casualty Reporting Command Post: 1-800-531-5501 who will connect you with someone from HQ AFSVA.

- In the event of an aircraft **incident or property loss**, make the telephone notification above immediately if during duty hours, or the next duty day if during non-duty hours.

## Attachment 6

### INSTRUCTIONS FOR COMPLETING AF FORM 270 (AERO CLUB OPERATIONS, RCS: HAF-SV (Q) 9495)

This report is a record of all aircraft operated by Air Force aero clubs and is the basis for determining insurance rates for each club. Reports are due to HQ AFSVA/SVPAR NLT the 15th calendar day following the end of the quarter. Continue reporting during emergency conditions, delayed precedence. Submit data requirements as prescribed, but they may be delayed to allow the submission of higher precedence reports. Submit by non-electronic means if possible. Discontinue reporting during minimize.

#### Specifics on Completing the AF Form 270 (figure A6.1)

**As of Date:** Last day of the quarter.

**DSN Number:** Self Explanatory.

**Fly Hours (This Quarter and Calendar Year to Date):** Base flying hours on Hobbs meter time; if a Hobbs meter is not installed or is inoperative, multiply tachometer time by a factor of 1.2.

**Sorties This Quarter:** Total number of sorties flown by all aircraft this quarter. (A Sortie is defined as one mission by a single plane)

**Aero Club Location:** Self Explanatory.

**Active Airmen:** Total number of active duty enlisted members.

**Active Officer:** Total number of active duty officer members.

**Retired:** Total number of retired members.

**Other:** Total number of members not reported in previous three categories.

**Total T-1 Hours:** Total number of T-1 hours flown.

**Total T-2 Hours:** Total number of T-2 Hours flown.

**Total T-3 Hours:** Total number of T-3 hours flown.

**N Number:** Enter the FAA assigned registration number of the aircraft.

**Aircraft Make and Model:** List any aircraft a club possesses, regardless of airworthiness.

Group I: Any aircraft an club owns.

Group II: Government and AFSVA Loaned Aircraft.

Group III: Leased Aircraft.

Enter the make, model, and type aircraft. Use more than one line if necessary, and fully identify the aircraft; for example, PA-28R-200, C-177RG, etc.

**Declared Value:** Declared value is the value a club places on an aircraft. The declared value for a Group I or III aircraft shall be within 15 percent of the average retail price, listed in the published price guide determined by HQ AFSVA/SVPAR, for a comparably equipped make and model. Declared value for Group II aircraft shall be the depreciable interest the club has in the aircraft. A club may change the declared value due to appreciation or depreciation; however, the club shall not change declared value on leased aircraft unless the lease agreement is also changed to reflect the declared value.

| **Seats:** Self Explanatory. If number changes, note date of change in remarks column.

**Rental Rate:** Enter the wet rate charged for aircraft rental. If an aircraft is rented at a dry rate, enter the approximate rental rate if the aircraft were to be rented wet.

**T-1 Hours:** Hours flown where the primary purpose was training leading to the issuance of a new rating or pilot certificate. This includes solo time flown for this purpose.<sup>1</sup>

**T-2 Hours:** Hours flown where the primary purpose of the sortie was training conducted for currency, recurrency, annual, or aircraft checkout requirements. An instructor pilot need not be onboard to log this training.<sup>1</sup>

**T-3 Hours:** Hours flown for other than T-1, or T-2 purposes. This includes recreation, business, TDY, etc., where no training is not involved.<sup>1</sup>

<sup>1</sup>A single sortie may involve one or more category; for example, an individual may fly 2 hours for recreational purposes and then an hour of pattern work for currency. In this instance that individual would log 2 hours T-3 and 1 hour T-2 time. In each case the total of T-1, T-2, and T-3 hours must equal the total time flown.

**Sorties:** Number of sorties flown by an individual aircraft during that quarter. (**NOTE:** A sortie is one mission that ends when the aircraft is shut down.)

**Remarks:** List any pertinent remarks on gain or loss of aircraft during the reporting period; to include exact dates of any status changes.

**Gain Loss:** Indicate gains/losses during the quarter in the remarks section. Once a club reports an aircraft as a gain or a loss, no further entries on subsequent reports are required until a change occurs. Enter the effective date of the gain or loss in the remarks column. Do not use a numerical designator for the month. (**NOTE:** The gain and loss dates of inter-command transfers must coincide to ensure no lapse in insurance coverage; therefore, the gaining and losing clubs must establish a mutually agreeable date on which the transfer occurs.)

Managers will sign the AF Form 270 in the lower right hand corner.

Figure A6.1. Aero Club Operations.

| AERO CLUB OPERATIONS |          |                     | AS OF DATE     |         | DSN NUMBER  |           | FLY HOURS THIS QTR |                 | FLY HOURS YTD |                  | SORTIES THIS QTR |                 |
|----------------------|----------|---------------------|----------------|---------|-------------|-----------|--------------------|-----------------|---------------|------------------|------------------|-----------------|
|                      |          |                     | 31 Dec 94      |         | 487-4979    |           | 2,000              |                 | 10,000        |                  | 1340             |                 |
| AERO CLUB LOCATION   |          | ACTIVE AIRMEN       | ACTIVE OFFICER | RETIRED |             | OTHER     |                    | TOTAL T-1 HOURS |               | TOTAL T-2 HOURS  |                  | TOTAL T-3 HOURS |
| Randolph AFB         |          | 100                 | 100            | 100     |             | 100       |                    | 1000            |               | 500              |                  | 500             |
| GROUP                | N NUMBER | AIRCRAFT MAKE/MODEL | DECLARED VALUE | SEATS   | RENTAL RATE | T-1 HOURS | T-2 HOURS          | T-3 HOURS       | SORTIES       | REMARKS          |                  |                 |
| I                    | 3478R    | C-172               | 22,800         | 4       | 46.50       | 400       | 200                | 100             | 500           | Gained 01 Oct 94 |                  |                 |
| I                    | 23456    | C-172               | 21,000         | 4       | 46.50       | 100       |                    |                 |               |                  |                  |                 |
| II                   | 432RS    | C-172               | 5,000          | 4       | 45.00       | 200       | 200                | 250             | 400           |                  |                  |                 |
| III                  | 6340Q    | PA28R-200           | 45,000         | 4       | 65.00       | 300       | 100                | 150             | 440           |                  |                  |                 |

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## **Attachment 7**

### **MEMBERSHIP FOLDER FORMAT**

Managers shall maintain member records on all actively flying members using the following format:

Section 1 ( In the following order, top to bottom)

- AF Form 1585 (Covenant Not To Sue)
- Copy of pilot and medical certificates for members exercising PIC privileges
- AF Form 1710 (Membership Application)
- Copy of proof of membership eligibility

Section 2

- HQ AFSVA Form 1586, Member Record Review

Section 3 (In reverse chronological order)

- All AF Forms 1584 (USAF Aero Club Standardization Record)

Section 4 (In reverse chronological order)

- AF Form 1584c (Answer sheets for latest Initial/Annual Standardization Exams)

Section 5 (In reverse chronological order)

- AF Form 1585c (Answer sheets for all aircraft knowledge examinations)

Section 6

- Local use items

## REFERENCES

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## ***VITA***

Keith Edward Brandt was born in New Castle, Indiana, on 13 Jan 1960, the son of Carlin and Mary Brandt. After completing his work at Shenandoah High School, Middletown, Indiana, in 1978, he entered Purdue University at West Lafayette, Indiana. He received the degree of Bachelor of Science with a major in Animal Science in May 1982. He continued his studies in the Department of Animal Science and was awarded a Master of Science in Reproductive Physiology in May 1986. He then attended the Indiana University School of Medicine where he received a Master of Science in Cardiopulmonary Physiology in October 1988, and the Doctor of Medicine Degree in 1991. He completed a residency in Family Practice at Community Hospitals of Indianapolis in 1994 and was Board Certified in Family Practice that fall. He worked in private practice in New Castle, Indiana before joining the United States Air Force in 1995. In 1983, he married Melinda Kaye Fields of Indianapolis, Indiana. They have two sons, Joshua and David, born in 1989 and 1991, and a daughter, Rachel, born in 1995.

This thesis was typed by Keith E. Brandt.